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BY
MUSSEY, M. D.,
PHILADELPHIA, PA.

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J. W. Mussey.

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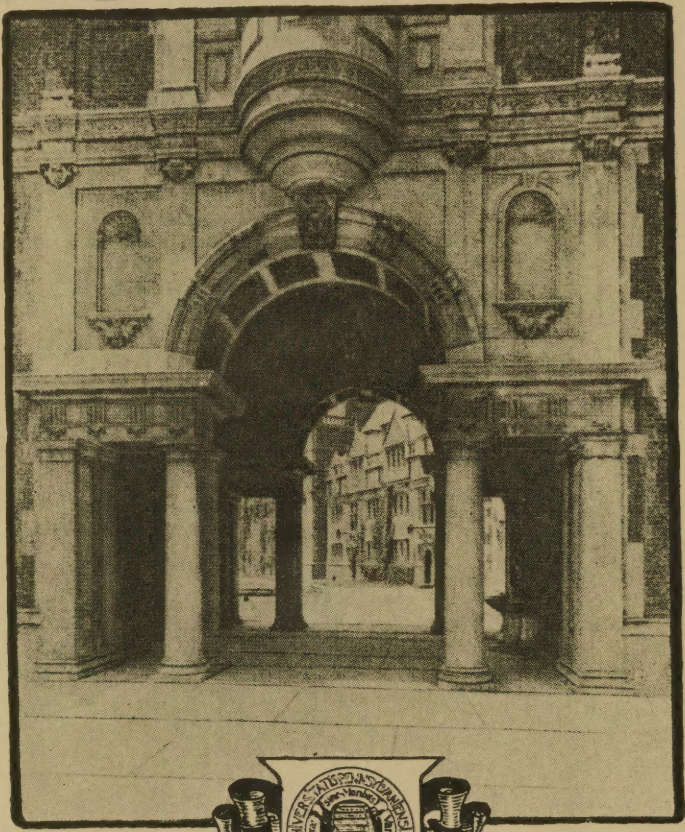
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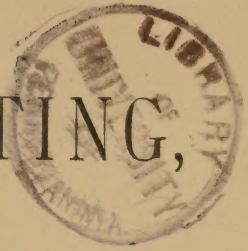


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PRESENTED BY

REMARKS ON VOMITING,



PHYSIOLOGICAL AND CLINICAL.

BY

J. H. MUSSER, M. D.,
PHILADELPHIA.

[Reprinted from the Transactions of the Medical Society of the State
of Pennsylvania for 1887.]

PHILADELPHIA:
1887.

REMARKS ON VOMITING, PHYSIOLOGICAL AND CLINICAL.

BY J. H. MUSSER, M. D.

PHILADELPHIA.

The symptom to which I beg to call your attention has been studied clinically since the dawn of medical observation, and is one that has attracted the earliest attention of the physiologist. The clinician considered the occurrence of vomiting, in the early days of medicine, either nature's attempt to "break" the disease or her sign of the crisis of the affection, and, on the one hand, assiduously endeavored to cause emesis, or, on the other, gladly welcomed its occurrence. Such was true of the general diseases—the fevers—while of local abdominal affections, it goes without saying, that to vomiting a prominent position as a symptom was given.

It is not surprising, therefore, that the older physiologists carefully studied its mechanism. Early in the pursuit of their studies they learned that one chief factor in its production was pressure on the stomach, caused by the simultaneous contractions of the diaphragm and abdominal muscles. We read that Van Swieten, in one of his commentaries upon Boerhaave's Aphorisms, has observed this fact himself in his experiments on animals; and he further adds the corroborative evidence of Wepfer, which was published as early as 1700. He cites, as further proof of the effects of pressure, the non-occurrence of vomiting in horses, by reason of the anatomical situation of the stomach, on account of which pressure cannot be exerted by the muscles just referred to.

But, in addition to the squeezing the stomach is subjected to, another factor in the mechanism of vomiting is essential, viz., the closure of the pylorus and the relaxation of the œsophagus, whereby exit upward is given to the gastric contents. It is to modern physiologists that we owe an elaboration of this part of the mechanism. To Schiff and Budge and Brunton we are indebted for a correct explanation of the physiology of vomiting.

From them we learn that there is a nervous centre for vomiting, which is seated in the medulla oblongata, in close proximity to, and

intimately connected with, the respiratory centre. It is to this centre that impressions are sent from the brain itself or from various portions of the body by their nerve supply, and from this centre that motor impulses are transmitted to the muscles concerned in the act of vomiting, and to the stomach and œsophagus. In his usual graphic manner, Brunton has described the entire mechanism. The importance of the subject alone is ample apology for taking up your time with its details, while if the paper of Dr. Brunton could be placed in your hands, this account would not be worthy of your attention.

By a very good diagram, an enlarged copy of which I here exhibit, Brunton indicates the afferent nerves which transmit impulses to the vomiting centre, exciting it to action. They are: pharyngeal branches of the glosso-pharyngeal; pulmonary branches of the vagus; gastric branches of the vagus; gastric branches of the splanchnic; renal, mesenteric, uterine, ovarian and vesical nerves. Fibres pass downward from the brain, conducting impressions to the vomiting centre from the organs of special sense, from the brain substance or its membranes when the seat of disease, or from central ganglia excited by emotion or imagination.

From this it is seen that vomiting is a reflex act; that its mechanism is quite simple; and that a proper understanding of this mechanism is essential to a correct appreciation of its pathology and treatment. Reference has not been made to the vomiting that occurs in the initial stage of many fevers, and in septicæmia, uræmia and allied affections, and to the vomiting of hysteria. In the former it, doubtless, is due to the direct action of the poisoned blood on the centre, but it also can readily be seen to be due to the propagation of impulses to the centre from the brain that is irritated by the blood. If the phenomena of hysteria are due to an abeyance of the processes of inhibition, the occurrence of vomiting can be said to arise from the non-control, by higher centres, of this centre.

We will not, with Brunton, indicate the individual instances of the production of vomiting through the medium of the respective nerves just indicated. The following desultory remarks, however, simply embody some recent personal experiences which, it is thought, are sufficiently illustrative of the mechanism of vomiting just detailed, and which, at the same time, are of some clinical interest.

One of the most pronounced varieties of vomiting that indicates

its reflex origin is that due to diseases of the uterus, ovaries, bladder and prostate gland. Concerning the last organ, the prostate, the following case came under observation: The patient was a middle-aged man, whose family I attended for some years. He consulted me for morning nausea and vomiting. Neither did treatment benefit it, nor a rather careful inquiry detect the cause of the vomiting. It occurred rarely in the middle of the day, although nausea was more or less persistent. His appetite was lost, his flesh and strength failed. After eager efforts to determine the cause, he confessed to the return of an old gonorrhœa, for which he consulted a specialist and received local treatment. The bladder, on local examination of the urine, was found to be free from disease, but the prostate was enlarged and tender, and his urethral discharge indicated a prostatitis. He then admitted the nausea ensued on the occurrence of dull, sickening and "rolling-like" pain in the prostate portion of the penis, and that unless it was checked, vomiting soon ensued. This was usually most noticeable in the morning, as, indeed, is true of most vomitings of reflex origin. All treatment to the stomach was stopped, and a more active local treatment instituted, with the gratifying result of prompt relief to the gastric symptoms.

Vomiting due to uterine irritation is of such common occurrence that it is not necessary to specify cases. Doubtless, it has fallen to the lot of every member of this Society to treat many cases. One of my patients is subject to attacks of metrorrhagia, during the occurrence of which she has the most violent attacks of vomiting, the smallest particles of the blandest food being rejected, while many odors excite an attack. Physicians in this city, in Boston, and in Canada, where she formerly resided, have used every known therapeutic resource without avail. The hemorrhages are accompanied by the shedding of large amounts of epithelium of the endometrium, and, until this casting-off is completed entirely, the vomiting does not cease.

Vomiting is well known to occur in ovarian irritation likewise. One of the writer's early cases has been the source of much thought and profit. Six weeks after the delivery of the patient in question, she began to vomit, in the mornings particularly, though occasionally during the day. Nausea was more or less constant, and sudden movement or unsavory odors readily produced the vomiting. A

careful examination of the abdomen failed to reveal any affection of the organs within, and a hopeful prognosis was given. She was unusually fat, with a large abdomen. The vomiting persisted, in spite of remedies. Soon the abdomen began to enlarge, and in six weeks a surgeon removed from her an ovarian tumor, which in the meantime reached enormous proportions. The fluid removed amounted to nearly two bucketfuls. The patient died shortly after the operation. Comments are unnecessary. It is certain, however, I do not now neglect the examination of any organ of the body in cases of not readily controlled vomiting.

The vomiting of peritonitis is due to direct irritation of the splanchnic nerves, reflexly influencing the vomiting centre. Examples occur to every one, and I will, therefore, only state that this local symptom *alone* has been observed by me in peritonitis, accompanied by the signs of collapse. Pain, tympanites and fever may be absent. Indeed, when a cause for the inflammation exists, as surgical trauma, I suspect peritonitis under these circumstances.* Moreover, all are familiar with the constant regurgitation of fluid that is seen, keeping the patient constantly employed ejecting the characteristic watery fluid. In these cases there seems to be a continuous relaxation of the œsophagus, whereby the orifice remains patulous, permitting of the constant flow of fluid. This is, no doubt, rendered more easy by the position which the stomach is made to assume on account of flatulency, viz., a position parallel to the long axis of the body, as in infants, in whom vomiting occurs with such ease. Tait and others treat acute peritonitis by salines administered as quickly as possible after the inception of the disease. The free purgation relieves the vomiting, and one can readily conceive that the serous discharge relieves the irritation of the membrane, and hence its nerves, by depleting its engorged vessels.

Vomiting due to cerebral disease is well recognized. In early life it is a characteristic feature of meningitis and tumor of the brain. It is likewise of moment in late life. I am of the conviction, however, it is not sufficiently recognized as one of the first symptoms of apoplexy. True, we find apoplexy occur after a full

* After an operation for strangulated hernia, painless watery vomiting ensued in 24 hours, with collapse. The surgeon did not agree with the writer regarding the presence of peritonitis the autopsy proved such to be the case.

meal, when the attack is associated with indigestion, with efforts at vomiting. It is not to these cases reference is made, but to cases of painless, often watery vomiting, occurring without nausea and without retching. A sudden, violent propulsion of the stomach contents, ceaseless, unrelieved by remedial measures, has been seen by the writer to precede other signs of apoplexy by from thirty minutes to twenty-four hours. In one case, a female, aged 65, the vomiting was painless and of a watery character, unattended by dyspeptic symptoms, yielding first to slight facial and lingual paralysis, followed by hemiplegia, stupor and coma. In another, the patient, æt. 60, was undressing a grandchild, when, with but transitory nausea and slight giddiness, vomiting took place. It occurred late at night, and was not due to food; in fact, the stomach was empty. I saw her twenty minutes afterward, lying, not paralyzed, but in a relaxed, helpless position on the bed. A full, strong, slow, high-tension pulse, the relaxed grasp of the hand, although without paralysis, a hesitancy of the mental acts, without change in the speech, except its slowness, and a peculiar expression of the face, led to the prophecy of apoplexy. In thirty minutes she died from a rapidly-developed coma. The notes of other cases might be given. It is sufficient to note, however, that in all the cases the pulse was slow and full, while in nausea and vomiting from other causes, in the aged particularly, it is weak and feeble. Moreover, some alteration of breathing is noticed. It is either irregular, or slow, or unduly hurried. It proves the intimate relation of the vomiting and the respiratory centres. Further, strength is seen, not weakness; in the apoplectics, the face is congested, not pallid, as in simple sick stomach. The other peculiarities of cerebral vomiting have been indicated. So chary have I grown in cases of the vomiting of the aged, that unless a quite patent cause can be observed, or other marked gastro-intestinal symptoms attend it, I give a grave prognosis.

There is another form of vomiting in the aged, the nature of which one must determine, viz. the vomiting of uræmia. The attacks do not occur as abruptly as in apoplexy, while they are attended by more nausea and more depression of the circulation and the general strength. The state of the urine and the usual phenomena of uræmia aid in the recognition of this form of vomiting.

Finally, gentlemen, another form of vomiting was presented to my

observation, the exact cause of which, in the cases in which it occurred, was for some time obscure. I refer to the vomiting that is seen in poisoning by sewer gas. Of four cases, instance the following: The patient, a middle-aged female, awakened every morning with nausea, followed in a short while by vomiting. At times the vomiting was immediate, again it occurred within the first three hours of the day. The first meal of the day could not be taken, and the desire for the others was slight. Treatment had no effect. General malaise, undue prostration, feeble pulse, headache of an ill-defined character and irregular bowels, attended the attack. Upon absence from home, immediate relief ensued. All symptoms recurred, however, on the return. After another temporary absence, a diphtheritic sore throat succeeded a second exposure. Then it was attention was called to the imperfect drainage, and after its correction the patient rapidly recovered and remained well. Coupled with the other three cases, I have learned to look for sewer-gas poisoning when with vomiting and nausea, loss of appetite and diarrhoea, marked general weakness, irregular chills and febrile paroxysms, feeble pulse, more or less constant headache and lack of energy coëxist. If attacks of sore throat occur, or if removal of the patient from home is followed by improvement, strong corroboration of the opinion is found.

I have thus, I fear, in a much too tedious and also very imperfect manner, dwelt upon this most attractive subject. I trust, however, some interest has been aroused in it, and that we are all impressed with the importance of instituting careful examination of every function and organ of the body in cases of vomiting, be it ever so simple in appearance.

... EXTRACTED FROM THE
TRANSACTIONS OF THE COLLEGE OF PHYSICIANS OF
PHILADELPHIA.

THIRD SERIES, VOLUME IX.

TWO CASES
OF
MALIGNANT ENDOCARDITIS.

BY
J. H. MUSSER, M.D.,
PHYSICIAN TO THE PHILADELPHIA HOSPITAL, ETC.

EXTRACTED FROM THE
TRANSACTIONS OF THE COLLEGE OF PHYSICIANS OF PHILADELPHIA,
MARCH 2, 1887.

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TWO CASES
OF
MALIGNANT ENDOCARDITIS.

By
J. H. MUSSER, M.D.,
PHYSICIAN TO THE PHILADELPHIA HOSPITAL, ETC.

[Read March 2, 1887.]

BOTH the cases included in this report have been named malignant endocarditis, although one of them is without the warrant of a microscopical examination. The clinical course and macroscopical appearances indicate such to have been its true nature, however. I venture to bring it before you thus labelled, to excite criticism, if necessary, and to ask your attention to one of the manifold phases of this interesting disease.

The case was under the observation of Dr. J. Henry Musser, of Lancaster County, and seen by my father, Dr. Benjamin Musser, in consultation. It occurred in their practice, in 1878. I recall the case both from conversations and letters concerning it at the time. Unfortunately, the notes of the case in Dr. Musser's possession have been mislaid. His memory and memo-

randa in his case-book feebly supply the deficiency ; fortunately, we have the morbid specimens.

CASE I. *Rheumatism ; embolism of large vessels ; cardiac murmurs ; gangrene ; chills and fever ; death. Autopsy : vegetations on mitral leaflets ; emboli in brachial and femoral arteries.*—H. R., male, æt. twenty-three, laborer, consulted Dr. J. Henry Musser, June 25th, on account of rheumatism. He was visited by his physician the first week in July once, the second week four times, and the third twice. On the first of August grave symptoms set in, and on the third of September he died. It will be observed, therefore, that, in July, H. R. was not very ill ; in fact, he continued at light work on his farm, and on the first of August was in the harvest field when the first embolus manifested itself. During that month he had rheumatism, and, for a short time before August 1st, chills and fever.

August 1. Sudden severe pain occurred in the right brachial artery. Could not be removed to his house at once on account of collapse. Dr. Musser saw him, and found the pulse absent at the wrist, the hand cold and cyanosed. Two days subsequently the femoral artery became plugged, much pain being occasioned at the time. The circulation in neither arm nor leg was ever restored, and gangrene ensued. Attention was at once called to the heart, and a distinct systolic murmur was heard at base and apex. During the month an irregular fever, with irregularly recurring chills, was present. Death took place from exhaustion, September 3d, thirty-three days after serious symptoms set in.

At the autopsy the vessels were plugged with emboli and thrombi, as exhibited in the specimens. The heart was enlarged by dilatation, and on the posterior cusp of the mitral valve soft fungating vegetations grew. Some of the chordæ tendineæ were surrounded by vegetations. The auricular surface of one cusp was rough, and minute ulcers were present. Fibrin clung to the vegetations, and recent clots filled the cavities. The aortic valve and the right heart were normal. There was no atheroma.

REMARKS.—Without doubt, in this instance, malignant endocarditis was associated with rheumatism, and

the type was essentially pyæmic. One might presume, however, that the so-called primary rheumatic symptoms were pyæmic in nature, or that the cardiac lesions supervened secondarily to the gangrene. The teachings of the autopsy do not sustain either supposition. The absence of old cardiac and vascular lesions, and the general integrity of the organs, preclude the possibility of pyæmia. The normal condition of the arteries (absence of atheroma), the absence of primary blood dyscrasiæ, or of any cause, save cardiac, for the emboli, defeat the second supposition.

CASE II. *Malignant endocarditis; chills, irregular fever, sweats; cardiac murmur and pain; vomiting and diarrhœa; marked embolic phenomena; jaundice; death. Autopsy: proliferative bacterial endocarditis confined to the mitral valve; emboli of skin, mucous membrane of mouth, of stomach, and of intestines, of spleen, kidneys, peritoneum and endocardium; embolus and thrombus in left iliac vein.*—M. S., female, æt. twenty-seven, white, German, married, admitted to Philadelphia Hospital August 26, 1886. At the same time her husband and children were admitted for a febrile complaint, thought to be of malarial origin. M. S. had been ill about six weeks, of an irregular fever, also said to be malarial. At this time she was nursing an infant which had been born one year before. The labor was natural, and she had a good getting up. Since birth of child M. S. has not menstruated. Three years previous to this illness she had an attack of malarial fever, and at one time had rheumatism of the leg. She never had any other ailment, was strong and hearty, and of temperate habits.

The family history of M. S. is very good. Her parents and several brothers and sisters are living. One sister died of pneumonia; the cause of death of another is unknown. On admission it was noted that the patient was prostrated and complained of chilly sensations, she sweated profusely, and suffered from nausea. The tongue was clean and moist; the bowels loose, five movements in twenty-four hours, thin and greenish in color; the nausea had disap-

peared in twelve hours; tenderness of the epigastrium was observed, but none in the iliac fossæ. The spleen extended, in the axillary line, from the sixth rib to the margin of the ribs. There was no eruption. Both cheeks were flushed. The skin and mucous membranes were pale, the hands quite anæmic. She was somewhat emaciated. The mind was clear. The lungs and heart were normal; the latter rapid in action, and rather feeble. Milk diet, stimulants, and quinia ordered.

Sept. 2. My resident, Dr. Dorland, detected a cardiac murmur two days ago, and to-day the following is noted: General symptoms and appearances about the same. Apex beat of heart in fifth interspace in nipple line; impulse moderately feeble; no thrill; pulmonary second sound accentuated; high-pitched systolic murmur at apex transmitted to axilla; no murmur at aortic orifice. Pulse rapid, small, and feeble. No cough; no dyspnœa. Ulcerative endocarditis suspected.

8th. The fever has continued in spite of quinine. The patient sweats profusely throughout the day, but not at night. Her anæmic appearance is striking. She is quite cheerful, but is evidently losing flesh and strength. The diarrhœa continues. The cardiac murmur has increased in intensity during the past forty-eight hours, and can be heard loudly at the angle of both scapulæ, louder at the right. Marked tenderness on pressure, and some pain complained of in the third left intercostal space. At the base of the right lung impaired resonance, and fine, moist, crepitant râles are observed. A few râles are heard at the right apex also. Short, high-pitched, jerking inspiration and prolonged expiration are detected at the right apex, and high-pitched inspiration at the left.

12th. Two days ago two small purpuric spots were observed on each upper eyelid, and to-day hemorrhagic infarcts are seen all over the trunk and on the upper extremities, pin-head to split-pea in size, bright red, not disappearing on pressure. Hemorrhages in the ocular and palpebral conjunctivæ of both eyes at inner and outer canthus. Rapidly losing flesh and strength. Sweats continue. Abdomen distended in epigastric and umbilical regions; large wavy impulse in epigastrium. Nausea and vomiting recurred the past five days; fluid dark, greenish tinge. The vomiting

occurs in the morning. Diarrhœa continues. Spleen readily felt below the margin of the ribs, tender. Lungs have cleared up. No cerebral symptoms. Heart's action irregular. Pulse small, feeble, rapid, dicrotic. Tenderness behind the sternum. Impulse (systolic) in second, third, and fourth left interspaces. In second interspace to the left of sternum very perceptible thrill. Systolic murmur not so loud as it has been at apex. Over third rib, left auricle, loud, booming systole, with "grinding" murmur. In second interspace to the left of the sternum loud, rough, high-pitched murmur. Pulmonary second sound muffled. Murmur over tricuspid not so distinct as at mitral, and probably transmitted; aortic murmur low in pitch, conducted from base. No œdema. Mind clear.

13th. Physical signs as above. Cardiac dulness extends from the left edge of the sternum one inch to the left in the second interspace. It extends in the third interspace two inches, and in the fourth three inches. Apex beat in nipple line. Intensity of murmur greatest in second interspace. Chill this morning. Urine scanty and high-colored, and contains blood and epithelial tube casts in abundance, and a small amount of albumin. General symptoms the same. Extreme prostration.

14th. Chill at 7 A.M. A little more drowsy than formerly; no delirium. Murmur in second interspace not so distinct. New capillary infarcts in abundance about the neck. Vomiting and diarrhœa continue. Infarcts in lips and on end of tongue. Conjunctivæ slightly icteric. Dyspnœa severe for half an hour at 2 P.M. Partially collapsed state, with gasping and sighing; excessively rapid pulse; stimulants relieved the patient. At 11 P.M. a second attack. During the day very irritable, and latter part of day drowsy. Died at 2 A.M., September 15th.

The following record indicates the daily fluctuations in temperature. The pulse record was not preserved, but from first to last it was rapid, 120 to 130 per minute.

Aug. 25, P.M., 99.3°. 26th, A.M., 100.4°; P.M., 103.2°. 27th, A.M., 101.1°; P.M., 103°. 28th, A.M., 101.1°; P.M., 101.3°. 29th, A.M., 102.1°; P.M., 102.3°. 30th, A.M., 103°; P.M., 100.4°. 31st, A.M., 100.1°; P.M., 101°.

Sept. 1, A.M., 102°; P.M., 101.2°. 2d, A.M., 102.1°; P.M.,

102.3°. 3d, A.M., 102.4°; P.M., 99°. 4th, A.M., 99°; P.M., 101.4°. 5th, A.M., 101.2°; P.M., 105°. 6th, A.M., 99.2°; P.M., 105°. 7th, A.M., 101.1°; P.M., 97°. 8th, A.M., 97.2°; P.M., 99.3°. 9th, A.M., 101.2°; P.M., 105°. 10th, A.M., 105.4°; P.M., 99.2° (chill at 6.30 A.M., and 9 A.M. temperature taken). 11th, A.M., 101.3°; P.M., 99.3°. 12th, A.M., 101.4°; P.M., 99.3° (chill, 7.30). 13th, A.M., 102.3°; P.M., 102°. 14th, A.M., 100.2°; P.M., 100.4°. 15th, A.M., 99.2°.

During the course of her illness careful search was made for localized purulent inflammation. The pelvic organs were normal, the bones were evidently free from disease, and inflammation of the middle ear was not detected.

Autopsy was made by Prof. Osler, Dr. Mussey, and Dr. Dorlan. *General appearance*: Medium sized body, somewhat emaciated. Skin pale, slightly icteric. Numerous petechiæ cover the face, chest, and arms; very numerous on right arm and wrist. Petechiæ range in size from a pin's head to a split-pea, and vary slightly in color from vivid red to dark blue; one or two only present central yellowish core.

Abdomen, thorax: Numerous petechiæ on parietal peritoneum. Slight serous effusion in both pleural sacs; few adhesions at right base; some petechiæ in parietal pleura.

Pericardium, heart: Excess of pericardial fluid, numerous small petechiæ on visceral layer. Right chamber relaxed, containing fluid blood and small clot. Left ventricle, tolerably firm dark clot. Apex of the left auricle is long, and can be seen turning round to base of pulmonary artery. Before removal of heart, fingers in pulmonary vein and pulmonary artery, both of which are free. Further dissection of heart: right auricle, little blood, staining of endocardium; a few petechiæ. Right ventricle, chamber large; tricuspid segments a little thickened; a distinct nodular thickening at angle of anterior and internal cusps. Pulmonary semilunar valve normal. Left auricle dilated. Seen from above, mitral orifice plugged by loose black clot and large grayish-white vegetations. After removal of auricle, the following conditions of valve appear: from base of posterior cusp of mitral, large irregular gray-yellow vegetations one inch in length extend into the auricle, passing out at right angles to the mitral ring,

and forming a sort of valve across the orifice. Entire auricular surface of this cusp covered with vegetations. Anterior cusp at free edge a large, warty vegetation projecting into ventricle three-fourths of an inch. The anterior part of this cusp is free. One or two of the chordæ tendineæ are encircled with vegetations. No involvement of endocardium, other than that of valves. Aortic cusps normal. So-called unprotected space below aortic ring presents deep depression, is closed, and to its base is attached a nodular thickening at angle of tricuspid cusps. Muscle substance of heart is pale, looks fatty; numerous ecchymoses. Coronary arteries free.

Lungs crepitant; ecchymoses on pleura. No infarcts. Bases œdematous, somewhat congested. Pulmonary artery normal.

Spleen weighs 1 lb. 5 oz., soft, capsule closely adherent at one spot. Pulp soft, reddish-brown; four large infarcts of some age, yellowish; others recent, none suppurating.

Kidneys somewhat enlarged. Capsule free, surface irregular. Numerous recent infarcts. Unusual amount of pigment. Right kidney, same changes; not so many large infarcts; the pigmentary changes about many of these infarcts are peculiar.

Pancreas: Few interlobular hemorrhages.

Stomach: Numerous ecchymoses. Many with small, central grayish spots. Mucosa about cardiac end much reddened.

Duodenum: Bile duct pervious; in mucous membrane small, superficial ecchymoses.

Small intestine: One or two small infarcts in jejunum. Toward valve the ileum was much injected, and the small infarcts were numerous.

Large intestine: Cæcum deeply injected; throughout the colon they are numerous, in size from two to ten millimetres. Some of larger show distinct nodular prominence, which on dissection is grayish-red, firm.

Liver: A little enlarged. No extravasations; tissue soft and light brown. No infarcts. Weight 5 lbs. 4 oz.

Uterus: Medium size. Os shows deep lateral laceration. Mucous membrane deeply pigmented. Muscle substance normal. Ovaries normal. Small cyst in broad ligament. Pelvic veins are normal. No trace of chronic inflammation about broad ligament. No thrombosis of veins.

Bladder : Few ecchymoses.

In the common iliac artery a plug is seen extending into the external iliac as far as the femoral; in the internal iliac it extends for two inches. On slitting up artery the thrombus is closely adherent, and at bifurcation it has softened, and has a purulent (?) appearance. Clot in internal iliac is one and a half inches long at least. Much pigmentation about the internal coats of the artery. No evidence of any local disease. Brain, spinal cord, eyes, and ears not examined.

Microscopical examination of the fresh clot in the artery, and the vegetation on the valve, by Dr. Griffiths, revealed the micrococci common to ulcerative endocarditis, the *Staphylococcus pyogenes aureus*.

Sections of the organs after hardening were made for me by Dr. William Gray. He reports as follows :

Heart : Fatty degeneration of the muscular fibre, with almost entire obliteration of the striæ ; increase of the interfibrillar connective tissue, and decided increase of the nuclear elements.

Spleen : Extensive cirrhosis ; obliteration of the cellular elements by fatty degeneration and an abundance of blood crystals (section from an infarct) are seen.

Kidney : Increase of intertubular connective tissue and tissue of Bowman's capsule. Proliferation of epithelial cells lining capsules and tubes. Cells degenerated and lumen of tubes plugged with casts. Section of infarct shows blood infiltrating into the tubules and between connective tissue fibres.

Intestine : Increase of connective tissue in submucous layer and of adenoid tissue of villi ; extensive lymphoid infiltration into mucous layer, villi, and glands of Lieberkühn. Granular degeneration of cells of villi. Infarct between and into submucous and muscular coat, blood crystals in infarct.

Artery : Entire absence of intima, with thickening of middle coat, and infiltration of blood into media.

Unfortunately, Dr. Gray did not get any of the proliferated mass on the valves. Dr. Gray was unable to find micrococci in the sections he had cut. They were given him without proper labelling, so that he did not know the tissue he was cutting. While this is to be regretted, it is enough to learn from the early and late examinations

of Dr. Griffiths, that bacteria were present. Dr. Griffiths readily found in the fresh treated preparations that micrococci abounded in the granular matter, and about the leucocytes of the vegetation.

The lesions otherwise found, were myocarditis, glomerulo-nephritis, and gastro-enteritis, with the usual histological changes about an infarct.

REMARKS.—So many thoughts arise in the contemplation of a case that represents so complete an evolution of a morbid process that one is tempted to indulge in lengthy remarks. We shall limit ourselves, however, and so be content with calling your attention to one or two prominent features.

Diagnosis. Observe, if you please, in the first place, the perfect picture of malignant endocarditis presented by the case. There was not a moment after the manifestations of the heart lesions were studied, that the diagnosis of endocarditis was doubted. It is true that before the cardiac murmur had been detected we could only say we had to do with a septic process. Who would say otherwise in a case of a young person with irregular fever, profuse sweats, and extreme exhaustion; with vomiting and diarrhœa, and enlargement of the spleen; with an acute inflammation of the kidneys without dropsy; with the physical signs of endocardial inflammation; and with the most pronounced appearance of capillary hemorrhages in the skin and mucous membranes, terminating in suffusion of the skin, conjunctivæ, and mucous membranes with the mild but ominous hue of icterus? It is true we considered at first whether, from the history and association with similar affections, the case was one of malarial origin. The use of quinia without result, the irregularity of the fever, the frequent pulse, the extreme sweats, and the diarrhœa,

led us to abandon this idea. Typhoid fever was rightly thought of, but momentarily. The spots, the tympany, and the characteristic stools were wanting; no approach to the typhoid state was observed in spite of the high fever and rapid pulse; the peculiar features of the tongue were absent, and at no time were the faculties dull or the mind wandering. The physical signs observed in the lungs, the profuse sweats, the quick pulse, and the diarrhoea, naturally induced the question of tuberculosis to arise. The disappearance of the lung affection, the absence of hurried respiration, and of the tubercle bacilli in the discharges, were sufficient counter-proofs.

Thus, by exclusion and by a careful study of the disease as it was gradually unfolded to us, we were enabled to make a diagnosis. In this, as in many instances, unfortunately, with waiting and watching, too soon the true nature of the affection was so legibly written that he who ran could read.

Class. So far as can be ascertained, the affection was idiopathic—using the term with the modern reservation. That is, a cause cannot be ascertained for the development of the disease in this case unless the slight rheumatic attack years previously is sufficient to attach the diathesis as cause and effect.

Type. Recall for a moment the marked symptoms present. The fever, the chills and the sweats, the clear intellect, the gastric and intestinal disturbances, clearly group the case with other examples of malignant endocarditis of the pyæmic type.

Special symptoms. Enough has been said of the symptoms in the history of the case. Your attention need not be called again to the vivid temperature range, the recurring chills, the grave renal symptoms, and the

pronounced capillary hemorrhages. The latter were striking—at first but a few, each day more and more appearing; confined not only to the skin, but seen in the lips and the tongue and the conjunctivæ, they presented a glaring picture of the pathological process. The anæmia, which was barely noted, deserves a remark. It was profound, and the appearance due to it at once excited attention. Certainly the hæmoglobin was much reduced, yet the patient was so ill we did not care to disturb her to ascertain its percentage.

One class of phenomena deserves more lengthy remarks—the physical signs of the cardiac lesion. At first, at the mitral orifice a systolic murmur transmitted in the usual direction was heard. It varied in loudness and pitch. Later it diminished in pitch and volume, and at the same time a very loud systolic murmur, high in pitch and grinding in character, was heard on the third left rib and in the second left interspace one and a half inches outside the sternal edge. So loud was the murmur in this situation that, especially as it was attended by a thrill, we thought the pulmonary valves were implicated in the disease. The occurrence, however, of an increased area of pulsation, most distinct in the second and third interspaces, and of an increased area of dulness in the auricular region, led to the conclusion that mitral stenosis was present. A presystolic murmur was not heard, however, and probably was not present. It was not created because of the projection of the vegetation over the orifice, in all probability. For a similar anatomical reason one can infer that the ventricle fills, partially at least, prior to and independent of contraction of the auricle. For with such an effort, at

once, communication would be cut off by the vegetation.

The systolic murmur was heard, in the latter weeks, loudest in the second and third interspace. Two causes can be invoked for this peculiar localization of the murmur. The projection of the mass from the auricular surface of the valve could readily throw the back flow of blood—the valve not closing from the situation of the second mass—into vibration, and thus murmur and thrill be produced and heard loudest over the auricle. While such an explanation suffices, a second cause for the murmur can be found in the position and dilatation of the auricular appendage. If such a view of the case is held, then the theory of Naunyn and Balfour to explain the mechanism of systolic murmurs in this location is well illustrated. The excessive loudness of the systolic murmur at the angle of the right scapula was very peculiar.

The ease of recognition during life, and the peculiar physical signs, are the features of prominent note in this case.

THE TREATMENT

OF THE

FINAL STAGES OF PHTHISIS.

BY

J. H. MUSSER, M.D.,

PHYSICIAN TO THE PHILADELPHIA HOSPITAL, BLOCKLEY.

REPRINTED FROM THE

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THE treatment of phthisis is of the most intense interest to the busy practitioner. No discourses in medicine are received with more avidity than those which detail a new method for the treatment of consumption, or hurl forth a new specific for its cure. The reason is obvious. But it is quite true, also, that a very large, indeed, too large a share of the monographs deal with the incipient stage of phthisis, but leave the treatment of the final stage to be evolved from the more or less limited experience of the practitioner. In fine, it is too often forgotten that we must alleviate suffering as well as cure disease. The burden of the subsequent, without a doubt most trite, remarks applies to the treatment of the final stage. Neither the first, nor the second, nor the third stage in its entirety, will be considered: only that portion of the third stage which precedes the finale. The racking torment of the beginning has passed; the dreadful anguish of the middle period is gone; the third period is fast waning, and that slowly creeping march of suffering and forbearance, filled with the inspiration of hope, has begun, to end only in the grave.

What are we to do in these final hours of suffering? Are we able to meet the demands upon us? Is the profession sufficiently taught to administer to the comfort of these afflicted ones? In vain does one look to the monographs and journals for suggestions; no words are uttered in the lecture-room; for aught we gather from medical literature the care of the patient dying of phthisis devolves entirely upon the nurse. Those of us who are hospital physicians alone can scarcely appreciate the mental anxiety and emotional distress of him who daily administers to the want of a patient, too often a friend, dying of this disease. It is easy for the *chêf* to leave such duties to the interne or the nurse. Quite different, however, for the family practitioner. In these cases, above all others, the powers of the true physician are

beautifully displayed. Here it is that the exercise of the high and holy qualities typified of old by the Master Physician are essential.

Yet, withal, a thorough knowledge of therapeutics is required for the pain that is here, and the ache that is there; for the cough of to-day, and the laryngeal spasm of to-morrow; for the dyspnoea of manifold causes; for the vomiting in the morning and the retching at night; for fever and sweating; for wakefulness and sleep; for the thousand and one ills—to relieve which the physician must have a mind fertile of expedient, and abundant of resource.

The suggestions regarding the management of the last stage of phthisis are derived alone from the writer's personal experience; much more profitable though it would be, time prevents detailing the experience of others.

External symptoms.—For the relief of erythema from pressure and moisture, remove the cause, if possible, apply astringent lotions and drying powders. The extract of hamamelis diluted, or the aqueous extract of the shops; borax and alcohol; the latter alone; sulphate of zinc, twenty grains to a pint of water; alum and water; carbolic acid (ten drops) in water (Oj); or alum and alcohol carefully applied, is grateful and remedial. Starch, rye flour, fullers' earth, oxide of zinc, subnitrate of bismuth, iodoform, and starch, are drying powders, named in the order of cheapness, that are efficient. For painful erythemata, iodoform 1 part, oxide of zinc 2 parts, subnitrate of bismuth 2 parts, and starch 4 parts, answer well.

A saturated solution of iodoform in ether, applied every day, or every other day, seems to relieve pain and remove congestion. A mixture of iodoform and surgical collodion relieves pain quickly. One must not forget the conventional soap-plasters, while glycerine, applied frequently, is also of service. Ointments of iodoform, or of zinc, with the extract of opium or belladonna, are often necessary. For bedsores remove pressure, and apply, by dusting, iodoform, Peruvian bark, oxide of zinc, or subiodide of bismuth. Oakum saturated with balsam of Peru is often excellent. Surgical principles will guide in the treatment of exceptional ulcers.

Œdema of the legs is frequently most distressing; bandages and elevation of the limbs are required. The swollen legs are the seat of a very painful erythema; here again, sedatives, as laudanum, and lead water, or hamamelis, are required. One of the easiest prepared and most soothing applications for any œdematous erythema, is the so-called starch poultice; ordinary starch mixed with water to the consistency of thick cream, spread on linen, and applied.

Apart from the usual pains in the thorax, the patient suffers from general aching and soreness, and from local areas of pain. Rubbing with stimulating applications, alcohol, soap liniment, arnica, chloroform liniment, or with dry heat, or applying hot flannels, is necessary. Local pains may be relieved, if in the course of the nerves, or in the extremities, or where undue pressure has been exerted, by *cannabis indica*; laudanum may also be used, but is inferior in value; lanoline is a good vehicle for any substance. Plasters are not generally pleasant; belladonna, opium, and soap may be selected.

Chest pains are usually severe. Use dry heat, by means of hot cloths, hot plates, or hot water bags, or sinapisms, or rubefacient liniments. Pain in the epigastrium and about the heart often occurs in the last week, and is most horrible; dry heat is the most serviceable of external applications. The pain appears to be due to tension on the adherent pleura by collapsing or contracting cavities. The secret of success in the treatment of the general and local pains, is the ability to ring the changes on various articles; the wrought-up nervous system, conjures up, or intensifies pains, which require an agile mind to relieve.

Gastro-intestinal symptoms.—For the dry, parched, or fevered lips, use cold cream; camphorated or benzoated oxide of zinc; camphor water and glycerine, with or without borax, or boracic acid; or even glycerine alone. An erythematous stomatitis is often present; demulcents are required. Decoctions of marsh-mallow, or gum arabic, are soothing; morphia, or the syrup of poppies in a demulcent, relieves the burning distress. The slippery elm bark of boyhood days, chewed, furnishes a soothing coating to the mucous membrane. The burning that attends erythemata may be relieved by allowing bits of borax to dissolve in the mouth, or by applying boracic acid locally. Ten grains of the latter to half ounce each of water and camphor water are sufficient. Alkaline waters iced are grateful.

For ulcerative stomatitis and thrush, phenol sodique, Dobell's solution, and Listerine, either of them well diluted, are detergent, and often soothing. If the ulcers are few, iodoform in ether touched on them will quickly heal. Boracic acid and camphor water in distilled water is a cooling mouth-wash; myrrh is commonly used by the laity. Alcohol in water can be used; a solution of the bichloride of mercury (1:1000) in iced water seems to be cleansing. Flatulency is a most distressing cause of suffering. External applications of heat, dry or moist, are required. The aromatic spirits of ammonia, spirits of chloroform, Hoffmann's anodyne, brandy and lime-water, creasote

and charcoal in pill, with or without pepsin, or a mixture of carbolic acid, tincture of cardamon, bicarbonate of soda, with mint water, most frequently relieve it. The recent preparations of pepsin, and pancreatin, are of inestimable value. A bitter before eating, with or without an alkali, prevents a succeeding flatulency; either *nux vomica*, gentian, or quassia.

Vomiting arises from laryngeal irritation, from cough, from exhaustion, from local gastric irritation by undigested food undergoing fermentation. Remove the laryngeal irritation by the local application of astringents and anodynes, by glycerite of tannin with or without morphia, or by astringent and anodyne lozenges. The vomiting of food by cough is prevented by administering morphia half an hour before meals, or by taking deodorized tincture of opium before the meal. The vomiting that occurs after rising is often prevented by taking some stimulant with nourishment, before assuming the erect posture: sherry and egg, or milk and brandy. The vomiting and retching that occur from excessive coughing is to be relieved by the anodyne that checks the cough; the more simple the anodyne the better; minute doses of morphia, if not contraindicated, are the best. The vomiting of exhaustion is controlled by stomachics, as quassia, or gentian in infusion; by stimulants, as champagne, brandy, and aromatic spirits of ammonia. Vomiting due to local irritation and congestion, caused by undigested and fermented food, is relieved by antifermentatives: carbolic acid, creasote, bismuth, and charcoal; by artificial aids to digestion, by the use of peptonized or pancreatized foods; by alkalies, as iced lime-water, or Vichy water, which act as local sedatives; by carbonic acid water, the effects of which are sedative. The stimulating effect of a sinapism, or the sedative effect of a blister, must be invoked by their respective indications. It must not be forgotten that lying on the right side increases the tendency to vomit, lying on the other side having an opposite effect.

Pain in the epigastrium, a most common symptom from flatulency, from an irritated congested stomach, from a diaphragmatic pleurisy, is to be met by treating the respective causes. A gastric sedative, as subnitrate of silver in pill before meals, with a minute dose of opium, prevents the pain that ensues after food.

Diarrhœa, if colliquative, may be controlled by stimulants, as burnt brandy, ammonia, or camphor; if tubercular, by large doses of astringents. Bismuth, from thirty to sixty grains in each administration, has served the writer as well as any combination of drugs. Logwood

is a most valuable astringent the fluid extract being used most frequently.

Intestinal flatulency is often the cause of diarrhœa, and can be prevented by salicylic acid, by antifermentatives, and by pancreatin. The diarrhœa that follows immediately on taking food is treated by an opiate; preferably, deodorized tincture of opium in small doses, five to ten drops, or the powder one-twelfth of a grain, with silver or bismuth, before meals. A septic diarrhœa ensues also in the last stage, and is to be checked by salicylic acid, by naphthol, or other forms of the naphthaline series recently introduced into therapeutics. The diarrhœa of amyloid diseases can only be controlled by opiates.

To relieve the cough of the last stage is most difficult. Dryness of the upper air-passages is most distressing, and local applications are generally painful. By the aid of a mirror, suitable remedies, always demulcent in character, can be applied to the congested areas about the larynx and epiglottis. Glycerine applied with a brush relieves the dryness; Dobell's solution thus applied is of service. The applications must be made often to the dry areas. Listerine with glycerine is of much value. Inhalations of terebinthinated vapors, or of simple aqueous vapors, are most grateful. The simplest form of inhalation is the best. We frequently have generated the vapor in a sick cup, covering the top and inhaling by the mouth-piece. The ineffectual efforts to cough can be aided by hot water, by hot water and brandy, and by the aromatic spirits of ammonia well diluted. Hydrocyanic acid has never been of any service in my hands for cough, while opiates are to be used with caution. A moderate dose of morphia may produce serious, even fatal symptoms. Codeia has disappointed the writer. Hyoseyamus and belladonna frequently add to the distress by producing dryness of the fauces; to relieve the dyspnœa, our utmost efforts are in demand. Ammonia, alcohol, Hoffmann's anodyne, and draughts of hot water are required in turn; external heat contributes to the relief. One of my professional friends says he has seen the air-hunger relieved by quebracho. Inhalations of oxygen should be theoretically of much service; the writer has never used them. The patient must be supplied with fresh, cool air, a source of relief to the distress. Attacks of dyspnœa, of course, are increased by flatulency, and this complication must be removed.

Hemorrhage in the last stage is usually profuse. A knowledge of the pathological anatomy of the lung at once shows the futility of astringents. Rest and opiates are essential, stimulants may be

required; ice or cold cloths over the chest are imperatively demanded if it persists.

Laryngeal and faucial tuberculosis increases the distress of the patient. As long as feasible, cocaine to render the taking of food possible must be applied to the ulcerated pharynx and larynx. Insufflations of morphia alone, or with iodoform and starch, must be practised, and over the larynx frequent fly blisters applied. One-eighth to one-quarter of a grain of morphia, with one grain of iodoform, and three of starch, insufflated, or added to treacle and retained by the patient as long as possible in the larynx, gives much relief.

In the late stage of phthisis some means must be used, but not as imperatively as in the earliest stages, to combat fever. Quinine frequently aggravates nervousness, and is inadvisable. The salicylate of sodium, doses of five grains, guarded with a drachm of whiskey, every three hours, is a reliable antipyretic. It is also of much service after the manner of administration by Jaccoud. The general restlessness and nervousness which ensue at this period of phthisis must be prevented or allayed by quiet in the surroundings, by free access of pure air, by the administration of light liquid food only, and by the use of stimulating anodynes, preferably Hoffmann's anodyne; for a similar purpose, valerian and asafœtida, by the mouth or rectum, or, if practicable, musk can be used; they are of much value. Gentle frictions allay restlessness, while ministrations with soft voice and gentle action allay an easily perturbed, nervous system. By means akin to these, we can truly administer to the sufferings of our patients. It is quite certain, however, that the firm voice, the truthful countenance, the inspiring touch, sustain and soothe in this trying passage through the valley of the shadow of death.

PERI-CÆCAL INFLAMMATION.

PATHOLOGY. BY JOHN H. MUSSER, M.D.

DIAGNOSIS. BY WILLIAM PEPPER, M.D.

TREATMENT. BY THOS. G. MORTON, M.D.

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PERI-CÆCAL INFLAMMATION.

[Discussed December 14, 1887.]

MORBID ANATOMY.

By J. H. MUSSER, M.D.

MUCH confusion appears to exist in regard to the nomenclature of the inflammatory affections of the region we are about to consider. It may, therefore, be well to state the meaning of the various terms which will be used in this discussion. By typhlitis we shall understand inflammation of the cæcum; by peri-typhlitis, inflammation of the peritoneum covering the cæcum; by para-typhlitis, inflammation of the connective tissue behind the cæcum. The term typhlitis is often used to include inflammation both of the cæcum and of the appendix. We shall, as suggested by Dr. Fitz, use the term appendicitis for inflammation of the appendix, appendicular peritonitis for inflammation of the appendix and its serous covering, and para-typhlitis for inflammation of the connective tissue around the appendix, or, if you please, peri-cæcal inflammation.

It is well to know the relative importance of the inflammatory affections in this portion of the intestinal tract. Typhlitis has been considered by systematic writers to be a frequent affection, and yet it is difficult for pathologists to find the records of autopsies in which this condition has been found.

It is true that some writers, especially the Germans, have described cases, particularly of stercoral typhlitis, in which inflammation and ulceration of the mucous membrane of the cæcum, by pressure from fecal impaction, was present. Most of us will, however, agree with Fagge that typhlitis is a good general expression used for all varieties of inflammation occurring in the right iliac fossa, but that in the majority of cases the correct term should be appendicitis. Fagge relates a case of Williams' in which the patient had all the symptoms of peri-typhlitis with a tumor in the right iliac fossa. He was

recovering from this when an acute affection of the pleura caused his death, and at the post-mortem examination there was found appendicitis, with ulceration and perforation, and not typhlitis, which, during life, was believed to be present alone.

Dr. Wilkes agrees with Fagge in this view, and they consider that the difference in degree of the inflammation alone accounts for the difference in the symptoms, and that the largest number of cases are due primarily to inflammation of the appendix.

That inflammation may occur in the cæcum as it may occur in any other portion of the large intestine no one will deny. But we can say from the records of Dr. Fitz that perforation of the cæcum is most rare, for in a most extensive research he was able to find but three cases, and in these instances it was due to foreign bodies. We shall, therefore, with Fagge, consider that appendicitis is the usual acute affection that occurs in the region we are discussing (see Appendix, I.).

A word with reference to the anatomy. The cæcum normally varies much in position as well as in shape. On the blackboard are drawings of different forms of the cæcum, as detailed by Treves in his lectures on the anatomy of the intestinal canal. He thinks that the cæcum is most frequently found, not in the right iliac fossa, but on the psoas muscle itself, or in the pelvis; that the cæcum is entirely surrounded by peritoneum rather than only partially, and, therefore, that behind there is no areolar tissue as was described by the older anatomists. He does not believe, moreover, that there is a meso-cæcum.

It is also of importance to note variations in the appendix in the consideration of peri-cæcal inflammation. The usual position, as found by Mr. Treves and by Dr. Fitz, is behind the ileum and its mesentery, with the tip pointing toward the spleen. The second most usual position is behind the cæcum with the tip pointing upward. Long appendices usually take this upward direction. Fitz also refers to its lying on the psoas muscle with or without the tip in the pelvic cavity. And, indeed, in many recent examinations I have made, this position was found to be most frequent. There are other variations in position.

It may stretch across the pelvis and become adherent to the sigmoid flexure of the colon, and in one instance I have seen the appendix in the inguinal canal associated with hernia. In another instance it was adherent to a pyosalpinx (see Appendix, II.). The appendix varies in size, it varies as regards the character of its walls, and it varies as

regards its contents. It may vary in length from one and one-fourth to nine inches. Here is a famous specimen in which the appendix was nine inches in length. It lay behind the colon, reaching to the under surface of the liver (see Appendix, III.). In subjects dead from causes not associated with this region, the appendix is often found as a cord-like body, having been the seat of previous inflammation. It may have a dilatation either at its blind extremity or in some portion of its length, especially pouch-like at the mouth. Sometimes the entire canal is dilated and filled with catarrhal products.

The character of the contents is of importance. Various articles have been found in the appendix, but chiefly fecal masses. Seeds of various kinds, buttons, bristles, worms, shot, pins and gall-stones have also been found. It is on account of the presence of these foreign bodies that we have the serious inflammatory action that arises (see Appendix, IV.).

I shall next speak of the morbid anatomy of peri-cæcal inflammation. First, with regard to the manner of making a post mortem examination in such a case. There is usually an extreme degree of peritonitis, and unless the post mortem is made with great care, it will be impossible to find the seat of perforation, if one exist, and the exact conditions and relations of the peri-cæcal inflammation. The easiest method is to begin at the first loop of intestine that is reached and from that unravel the bowels, separating with great care the adherent parts. If a source of obstruction is found, tie the bowel on both sides and examine the portion in situ, opening the gut if necessary. Such an examination is absolutely necessary in order to make a thorough study of the part.

Inflammation of the appendix occurs both of the simple catarrhal and of the ulcerative type. That we have catarrhal inflammation we know from the lessons of morbid anatomy. Clinically, it would be impossible to determine the presence of such an inflammation, however. Catarrhal inflammation with succeeding ulceration, local peritonitis, and, finally, perforation, and encysted peritonitis also occurs; and the following conditions are generally found after death. In the first place, on section of the abdominal walls there is found, especially in the right iliac region, an œdematous state of the tissues; not only may there be serous œdema, but there may also be infiltration of pus, due to the burrowing from the primary abscess. The peritoneum, if involved, will exhibit an intense degree of inflammation with the characteristic injection, sometimes general, sometimes limited; more particularly marked to the right iliac fossa and the pelvis (see Appendix, V.). Serum will be found in the peritoneal cavity, and in some instances pus;

blood is occasionally found. In the more severe forms, especially, large flakes of lymph cover the intestines, the parietal peritoneum, and the abdominal organs. The intestines are also more or less adherent to each other, depending upon the duration and the degree of the inflammation. The location of the abscess, for it is usually circumscribed, depends upon the position of the cæcum. There are three positions in which it is most frequently found—either in the right iliac fossa just above Poupart's ligament, or behind the cæcum, or in the pelvis. In a case which recently came under my observation, the abscess was found in the pelvis, one and one-half inches below the level of the psoas muscle, four inches from the anterior superior spine of the ilium on the right side, and two inches from Poupart's ligament. In another case the abscess was found behind the cæcum in the connective tissue of the right iliac fossa. The size of the abscess varies, sometimes containing only two or three ounces of pus, and in other instances as much as a pint or more has been removed. The walls of the abscess differ according to its position. In the first instance mentioned the upper wall was made up of the cæcum, the right, by the side of the pelvis while posteriorly and on the left it was circumscribed by the adherent intestines. The walls of the abscess may be composed of the intestines alone. The appendix is always found in the abscess, and has undergone changes varying in degree with the duration and severity of the inflammation. Inflammation and ulceration of the mucous membrane, serous or purulent infiltration of the walls, with perforative ulceration and encysted or localized peritonitis (the abscess) are discovered. In some instances a portion has sloughed entirely off and cannot be found, having undergone dissolution; in others the portion beyond the ulceration is found as a soft mass of necrosed tissue (see Appendix, VI.). The perforation varies in size; sometimes it completely surrounds the appendix, or even severs it in two, or it is sufficiently large to admit a probe only, while even in other instances it can scarcely be detected. Sometimes two or more perforations are found, and frequently they are covered by recent lymph. The canal of the appendix is very often dilated. We usually find in the canal, near the cæcum, a foreign body; it may, however, be found in the abscess. In the cases detailed by Dr. Fitz, foreign bodies were found in sixty per cent. In other cases their presence or absence could not be positively determined, from haste at the autopsy, from their disintegration, or from their discharge into the bowel, so that the proportion is probably larger than stated. There is one point of importance in reference to the surgery of this region, and that is, that the perforation

usually occurs within one and one-half or two inches of the colon. Whatever may be the length of the appendix, the perforation is as a rule found at the point just indicated.

There are, of course, many cases which do not terminate fatally. Under such circumstances resolution takes place, or the abscess becomes encysted, or the abscess ruptures into some neighboring organ. Dr. Bernardy related a case to me where rupture occurred in the upper portion of the rectum and also through the abdominal wall at the umbilicus. Dr. Edwards had a case in which fully one and one-half inches of the appendix had sloughed off; the abscess ruptured into the bowel, carrying with it the portion of the appendix and a mass of grape seeds, which were discharged together. The abscess may discharge through the abdominal wall, through the scrotum, into the hip-joint, through the loin or the perineum, or in other directions. Sometimes the pus burrows upward, even as high as and into the pleural cavity. I may say too, that the bladder is a favorite seat for the rupture of such abscesses.

That cure may take place in cases of perforation of the vermiform appendix, this specimen distinctly shows. It was prepared by Dr. William Pepper, and is in the museum of the Pennsylvania Hospital. The patient died of another affection. The appendix was cord-like, except in one place, where an old perforation was seen, with organized blood-clot and lymph on the surface.

These are the chief points in regard to the morbid anatomy of peri-cæcal inflammation. In the first place, that peri-cæcal inflammation is due to the inflammation, ulceration, and rupture of the appendix vermiformis with the secondary formation of an abscess or an encysted peritonitis; that the position of the abscess depends entirely upon the position of the appendix; that the further course of the abscess cannot be determined; that in the larger number of cases the inflammation and ulceration are due to the presence of a foreign body occluding the canal—a retention inflammation. The sequence of events appears to be as stated; and while it may appear to be a refinement of terms to differentiate between typhlitis and appendicitis, it is almost necessary in order that a correct and well-defined appreciation of the pathology be determined, so that early and proper treatment may be instituted. Unless such a refinement be made, cases of this kind will be frequently treated as simple typhlitis, whereas in sixty per cent., or perhaps a larger proportion, they are cases of inflammation of the appendix.

APPENDIX.

The following notes are presented explanatory in a measure of the text. They are based on the appearance of the specimens the writer had on exhibition at the meeting, collected from private sources and from hospitals. Some twenty specimens were obtained for this purpose. The writer's best thanks are due to Drs. Pepper, Edwards, Bernardy, Willard, Woodbury, Longstreth, Hinsdale, Seltzer, Daland, Bodamer, and others, for notes and specimens. Some excellent descriptions may be found in the Catalogue of the Museum of the Pennsylvania Hospital.

I. Strictly speaking, we should say the sequence of typhlitis, perityphlitis, and peri-cæcal abscess occurs but rarely. A typhlitis and perityphlitis, no doubt, are seen clinically, but the cases do not come to the post-mortem table unless perforative appendicitis occurs conjointly. For this reason, and because a similar sequence of lesions does not obtain in similar inflammations of the large bowel under like circumstances, as fecal impaction from stricture, or from paresis in the aged or after typhoid fever, the pathologist may well doubt the existence of perityphlitis and succeeding peri-cæcal abscess without conjoint primary appendicitis. In the more violent inflammations of the gastrointestinal tract, in gastritis, enteritis, or in dysentery, such sequential lesions moreover are not found.

II. *Case I.*—Matilda Thomas, aged one hundred and four years. Cause of death, exhaustion from strangulated hernia. Abstract from autopsy record, Philadelphia Hospital. Abdominal cavity: no effusion; adhesion of large and small intestine; appendix dilated to size of first finger, end of it incarcerated in inguinal canal, with portion of mesentery and small intestine; so much post-mortem discoloration, could not determine color of parts; local peritonitis; in canal and layers of muscles and fasciæ considerable amount of greenish pus; the portions outside of canal adherent to the bladder, uterus, and ovary, the latter being included in the inflammatory mass. Organs occupy normal position. (Musser.)

Case II.—Philadelphia Hospital. Female, aged twenty-two years. Appendix four inches long, dilated to size of finger, contained mucoid fluid, adherent to a large pyosalpinx. (Musser.)

III. From Museum of Pennsylvania Hospital, described by Wistar. (See a Catalogue of Pathological Museum, 1869.)

IV. Cranberry seeds (Mears). Fecal concretions (Hartshorne, Daland, Hinsdale, Seltzer, Musser). Grape seeds (Edwards, W. A.). A concretion one-half inch long and one-quarter inch thick, cone-shaped, apex pointing toward the perforation in the appendix, base concave, firm, fecal color and odor, in mass of which black bodies, size of cranberry seed, were found. It completely occluded the canal, causing retention of the natural secretion, inflammation, ulceration, etc. The perforation was one-eighth inch from the apex of the concretion (Musser). A "phosphatic concretion" in Mütter Museum (Woodbury).

V. General peritonitis (Woodbury, Willard, Hall (Mütter Museum), Bodamer [Case I.], Seltzer, Pepper [1637 Pennsylvania Hospital Museum], Long-

streth [Pennsylvania Hospital Museum Catalogue, No. 1368¹⁰], Meigs [Pennsylvania Hospital, 1366], Bernardy, Musser). Local peritonitis (Mears, Pepper, Hinsdale, Bodamer [Case II.], Hartshorne, Musser).

VI. Two inches of the appendix necrosed, slate-gray color, soft, floated in the pus, attached slightly to the healthy stump (Musser). Appendix sloughed off. Male, forty years. Peritonitis fourth day (Bodamer, Case I.). Appendix one and a half inches long, ulceration one inch from bowel, a few lines in diameter. No communication between appendix and cæcum. Gelatinous mass in appendix (Bodamer, Case II.). Appendix removed by amputation, was attached by its blind extremity to omentum, also removed. Length two inches, one inch occluded by concretions, and one dilated and empty (Woodbury, Mütter Museum). Appendix two and a half inches long. Ulceration three lines in length and two inches in width, half an inch from extremity. Canal not dilated. Walls not thickened (Willard).

Mütter Museum, College of Physicians of Philadelphia, A. D. Hall. Vermiform appendix, cæcum and portions of ileum, perforation, peritonitis; death. When recently examined a perforating ulcer of the appendix was found, through which a grooved director could be passed, communicating freely with the peritoneal cavity. There are two perforations, one, 2.5 centimetres, from the caput coli; the muscular coating of the appendix appeared to have been destroyed by ulcerations, and then the peritoneal coat had given way in three small openings about 2 millimetres in line. These were arranged in a triangular manner. The second was a solitary perforation, 4 centimetres from the end of the appendix. Although thick patches of lymph had been thrown out, no attempts to limit the effusion of foreign material by lymph barriers was discoverable. There was nothing to show that any foreign body or concretion or impaction had been the origin of the lesion. Fluid pus was found in the interspace between liver and stomach, and about six ounces of turbid serum were in the pelvic cavity. The intestines were glued together.

Mrs. C., aged twenty-five years, mother of two children, youngest four months old. Death on fifth day of idiopathic peritonitis, with characteristic symptoms.

Catalogue of Mütter Museum, College of Physicians, E. Hartshorne. Appendix, gangrene and perforations. Recently observed the appendix was inflamed and greatly enlarged, and intimately adherent to surrounding parts; was distended to a sac 5 centimetres long and 2 centimetres broad, and communicated by a small opening with the cavity of head of colon; walls thickened, infiltrated with dark blood and serum; its peritoneal coat highly injected and covered with exudation, and the mucous lining showing traces of extensive inflammation, which had run into a superficial gangrene. The latter had produced a honeycombed appearance of the inner surface, and had covered it with a dark greenish, pulpy, and extremely fetid matter. On its side, about two-thirds of the distance from the cæcal extremity, an ulcerated perforation, some 6 lines in length and 3 lines in width, was found, from which fluid fecal and other matter had been flowing in small quantities. Immediately behind this opening, and encased by the appendix, a peculiar, moderately hard concretion, of the shape and color of an elongated olive stone, presented itself, having been apparently moulded by the cavity by which it was contained.

This was in layers, and was probably hardened fecal excrement which had accumulated by slow oozing of the fluid contents of the large intestine through the small orifice of the distended appendix. No other evidence of morbid action in abdominal cavity, except congestion and œdema of ovaries and fimbriated tubes. Death on the fifth day from peritonitis.

DIAGNOSIS.

By WILLIAM PEPPER, M.D., LL.D.

I FEAR that the remarks that I shall make may seem vague and desultory, for it is difficult to compress what is to be said within the very reasonable limit assigned. I am quite willing to accept the terms suggested by Dr. Musser, but I do not think that the term paratyphlitis, as indicating inflammation of the peri-cæcal connective tissue, is likely to gain general usage. It is probable that the term peri-typhlitis will continue to be used to indicate inflammation of the walls of the cæcum and of the neighboring connective tissue. Still, anatomically and for parity of nomenclature, it may be well to recognize paratyphlitis, as indicating inflammation of the peri-cæcal connective tissue.

The anatomical points made clear by Dr. Musser are very striking. I would merely add to these one or two facts. In the first place, the appendix presents evidences of disease in a very large number of indifferent autopsies. I remember the report of a series of three hundred autopsies, in which there were signs of disease of the appendix in thirty-three per cent., although in none of these was there a history of typhlitis. We have this little organ, singularly useless physiologically so far as we know, placed in a singularly unfavorable position anatomically, very liable to become impacted, so formed that escape of its contents is very difficult, and very prone to become diseased. We must recognize the fact that the appendix is often diseased when we have no reason to suspect such a condition. I cannot agree, however, that the cæcum also is not often the seat of disease. In a long experience in which I have paid much attention to these cases, I have collected a number of instances of independent cæcal disease, where the cæcum alone presented lesions, sometimes going on to chronic inflammation, ulceration, and perforation. The real condition of things seems to be this. In the first place, there are many cases of

mild appendicitis which cannot be recognized during life ; in the second place, there are a considerable number of cases of typhlitis where the symptoms are chiefly due to inflammation of the walls of the cæcum and of the peri-cæcal connective tissue, which end in recovery. It is impossible in these cases to determine what proportion of the symptoms has been due to appendicitis. Finally, there are also a good many cases of severe appendicitis resulting in ulceration and perforation, with the formation of circumscribed abscess or of general peritonitis. If we could accept the view that perforation of the appendix, leading to peri-typhlitis or para-typhlitis, often resulted in recovery by resolution, it would be a matter of comparative indifference where the lesion was chiefly situated ; but do clinical experience and anatomical records justify the view, that perforation of the appendix, followed by peri-and para-typhlitis, often ends in resolution ? It is true that I have found one specimen and that others have been placed on record where perforation of the appendix has not been followed by grave results, but do these amount to anything comparable with the great mass of cases where lesions of the appendix have occurred with peritonitis and fatal result unless relieved by operation. It seems to me that we have to recognize that while in typhlitis, peri-typhlitis, and para-typhlitis, in all probability appendicitis always exists, yet it is often present in only a very mild degree, and can cause only a small portion of the symptoms. This conception seems necessary to a correct diagnosis of these lesions ; it is necessary in guiding our treatment.

There appear, then, to be two classes of cases. In one the affection is more limited to the walls of the cæcum and the peri-cæcal connective tissue, and the appendix is affected to a comparatively slight degree. We have no record as to the frequency of such cases. The record is not to be sought on the post-mortem table, for the large proportion of these cases if properly treated from the beginning end in resolution. I have the records of scores of such cases, the vast majority of which ended in resolution. I think the experience of those I address would give a large number of cases of inflammation in the cæcal region so terminating. . So large is the number that I cannot consider that in any large proportion of them did perforation of the appendix occur. As I have seen them, these cases are marked by pain as the initial symptom, not excruciating in character, not associated with evidences of collapse, often accompanied with nausea and vomiting, and with elevation of temperature, which continues to rise until decided fever is present. With these symptoms there is excruciating tenderness in the right iliac fossa, a sense of fulness and induration, not rarely with

dorsal decubitus and flexed thigh, with a constipated condition of the bowels possibly preceded by one or two irritative movements during the first day, and with these there is considerable acceleration of the pulse. In proportion as the induration and swelling is early and marked, it has seemed to me that the chances are that the appendix is not seriously involved, but that the affection is chiefly one of inflammation of the walls of the cæcum and of the peri-cæcal connective tissue with exudation, and I have no doubt usually accompanied with considerable fecal impaction of the cæcum.

If absolute rest be insisted upon, if abstinence from food and absolute avoidance of interference with the state of the bowels be adhered to, if local depletion be employed, if counter-irritation followed by the application of the ice-bag, or warm fomentations be employed, and if the internal use of opium and mercury be begun early, the vast majority of such cases terminate in resolution and complete recovery if the convalescent is properly treated—that is, if these restrictions be insisted upon until the sensibility of the part is entirely removed. I am satisfied that the well-known tendency to the recurrence of typhlitis is largely dependent upon the management of the convalescence from the primary attack. Such would seem to be the diagnostic marks of this type of case.

On the other hand, we know very well that such cases not rarely go on without resolving, that the induration extends, that the symptoms become aggravated and possibly are such as to indicate suppuration, and that at periods varying from seven to fifteen days pus formation occurs. Such cases demand operative interference, and are successfully treated by the Parker operation. The existence of pus can often be demonstrated by exploratory puncture with a fine aspirator needle.

There is a second class of cases of an entirely opposite character, with which we are all equally familiar. Here the patient may apparently have been in almost perfect health, for perforation of the appendix may occur without any previous symptoms of which the patient had complained. But in these cases there has been a catarrhal appendicitis; the fecal matter which is present in nearly every healthy appendix, is no longer able to circulate and escape, because the outlet is partially closed by the swelling of the mucous membrane; the pent-up secretions and the irritating fecal matter excite more serious inflammation in the walls of the appendix; ulceration is established, and finally perforation occurs, and the symptoms of the attack begin. I have rarely seen a fatal case of disease of the

appendix where there was not stenosis of its orifice. I think that, to a large extent, it is this tendency to closure, and the accumulation of the secretions and of fecal matter, that causes the more serious type of inflammation and the occurrence of perforative appendicitis.

The first symptom in these cases is usually intense and excruciating pain, so severe at times as to cause collapse, occasionally so severe as to be followed by death in a few hours. Following this there is the rapid development of the signs of peritonitis. The pulse becomes frequent. There is marked tenderness, not in the iliac region only, but also toward the middle of the abdomen. The belly becomes distended, but there is no induration to be felt; there may even be no fulness in the right ileo-cæcal region. The appendix often lies under the cæcum, and I have frequently percussed these cases with great care without finding any evidence of dulness or of induration. After the occurrence of the initial pain, the fever may not rise very rapidly. There may be only moderate febrile reaction for one, two, or three days, associated with continued, moderate pain simulating an ordinary catarrhal attack with intestinal colic. For two or three days these cases may be viewed as not being seriously ill, so delusive may be the symptoms after the subsidence of the initial pain. In these cases there is absence of ileo-cæcal infiltration, or induration, or tumor, or prominence, or dulness on percussion. There is in these cases a less degree of vomiting than in the first class of cases mentioned. The vomiting is often rare, and only induced when the stomach is taxed. The bowels are quiet, but not so obstinately constipated and not so strongly resistant to the action of laxatives as in typhlitis with more or less impaction of the cæcum. After a time which varies with the intensity of the attack and the direction which the exuded matter has taken, there appear the symptoms of a rapidly spreading, general peritonitis. The belly becomes greatly distended and tender, and the coils of intestine are outlined through the tightly stretched skin. The vomiting becomes frequent, the temperature rises, the pulse grows thready and rapid, and we have the familiar signs of general peritonitis. These cases end fatally, from exhaustion, in from five to ten days.

Here are two groups of cases which seem to me to differ not only in degree, but also to differ in the seat of their lesion and the character of that lesion. I cannot believe that in any great number of cases of the first group there is perforation of the appendix. Yet, unless perforation is present, we have seen that all the other lesions of the appendix may exist without the production of any serious or charac-

teristic symptoms. Therefore, I cannot attribute to ordinary appendicitis the symptoms of peri-cæcal inflammation which mark the first group of cases. These symptoms we must assign, in chief part, to the inflammation of the walls of the cæcum and of the peri-cæcal connective tissue.

It is, therefore, of momentous importance that we should be able to diagnose the sort of case that we have to deal with, and that at the earliest moment. I should say, that in proportion as the tumor, prominence, induration, and dulness are marked, delay is safe, especially if rectal examination—the mention of which I have postponed until the last—does not indicate any fulness on the right side of the roof of the pelvis. If this is present, it indicates an amount of exudation which will probably end in abscess, and is a strong indication for operation. If digital examination, pushed if necessary to the extent of the introduction of the whole hand, reveals no fulness in the roof of the pelvis, I think delay for several days is justifiable, and with such treatment as I have indicated, the symptoms will, in the majority of cases, subside; and although the case is fraught with great anxiety, resolution will begin, the symptoms will become milder, and the patient recover, and under proper treatment the part will be restored to absolute health without relapse. Even if frequent relapses occur—and I have seen as many as fifteen or eighteen in the same individual—complete recovery may follow a protracted course of treatment with absolute rest, rigidly restricted diet, constant counter-irritation, and suitable alterative treatment internally.

Of course if, after waiting a few days, there is no evidence of the commencement of resolution; if the fever is sustained, particularly if it assume a hectic type, we know from experience that suppuration will not be long postponed. Exploratory puncture should be made, and operation should follow without delay.

The most important question to be considered is, What is the earliest moment that we can establish the diagnosis? On account of the shortness of the time, I limit myself to the differential diagnosis between the two forms of cæcal inflammation to which I have referred. The initial symptoms give us some indication of the seat and the gravity of the attack. Typhlitis and peri-typhlitis soon offer demonstrable symptoms, but as the appendix is hidden under the intestine, the symptoms of perforative appendicitis are often obscure for two or three days. The most careful palpation may fail to show the slightest fulness. The patient may complain of pain over the cæcum, or over the hypogastrium. External examination does not aid us in the

diagnosis. Are there any special features which will help us? I would again refer to the importance of the rectal examination. Early and repeated rectal examination is the most important diagnostic means we possess in this class of affections. Often, on opening the body after death, there is no appearance of peritonitis in the exposed coils of intestine. There is no inflammatory process seen outside of the cæcum, and nothing is found until the cæcum is lifted up, when it is discovered that the inflammation is behind it, and extends downward to the pelvis. Sometimes, on removing a layer of lymph, you disclose the pelvis filled with pus. In such cases, if rectal examination should give a sense of distention of the right side of the pelvic roof, might not a puncture be made with a curved exploring needle introduced through the rectum? This has suggested itself to me, although I have never tried it. In this way we might demonstrate the presence of pus, when it would not be possible to do so through the external abdominal wall.

In many of these cases there has seemed to be an unusual abundance of urine and an increased frequency of urination. I think that the former is associated with the absence of vomiting. In typhlitis and peri-typhlitis, there is often so much vomiting that very little liquid is absorbed, and the urine becomes concentrated. I have seen cases of perforation of the appendix, where the urine was voided at intervals of an hour or an hour and a half, the total amounting to a large quantity.

Again, it has seemed to me that in perforation the pain is more apt to extend to the middle line of the abdomen, and sometimes into the genitals, especially into the right testicle and spermatic cord.

The agony of pain which marks the initial lesion, the development of fever, the acceleration of the pulse, the distention of the abdomen, the pain referred to some point in the ileo-cæcal region, the comparative rarity of vomiting, the absence of induration and tumor, possibly, the ability to detect fulness or induration in the roof of the pelvis by rectal examination, the frequent micturition with a free supply of urine, the pain possibly radiating in the direction of the genitals, have, I think, been in the majority of cases the most marked symptoms.

Suppuration occurs in these cases very early, even earlier than in the other group of cases. In one case in which Dr. Keen operated for me as early as the close of the third day, perhaps the earliest operation on record, a pint of pus was found in the pelvis.

So much for the suggestions that I am able to offer with reference

to these important affections. The point to which we should bend our exertions should be to determine the early diagnostic symptoms of these two varieties of cæcal inflammation, and to see whether there is a constancy in the description that I have given of the first type of inflammation of the walls of the cæcum which, under proper treatment, offers a considerable hope of recovery. We should, in particular, strive to point out the indications for operation in the two classes of cases.

I would ask if general peritonitis may not be a positive indication for instant operation. It has been asserted that general peritonitis is not a contra-indication to laparotomy under other circumstances. If this is the case, the development of general peritonitis in a case of inflammation of the cæcal region would at once indicate operation, for after this develops death results under medical treatment.

I will not take up the question of the diagnosis of these affections from intussusception and internal strangulation. Although this would be necessary for a comprehensive discussion of the subject, the time at our disposal will not permit it on the present occasion.

TREATMENT.

By THOMAS G. MORTON, M.D.

For practical purposes the treatment of peri-cæcal inflammation must be divided into two subdivisions, that of the pre-purulent, and that of the post-purulent stage; or, 1st, before formation of pus or of appendix perforation; and, 2d, after that event.

The treatment of the pre-purulent, irritative, or simple inflammatory disorders of the cæcum and its surroundings, or appendix, should consist of rest in bed, restriction of diet to nourishing liquids, hot poultices or fomentations frequently replaced upon the parts, perhaps local depletion, and possibly the hypodermatic exhibition of morphia to control pain; whilst the bowels should be kept open and free from accumulations of gas and feces by the administration of salines and enemas—perhaps with the addition of turpentine to the latter.

Those disposed to cavil at the advice just given, I would ask: Shall we keep the bowels in liquid condition, and so best prepared to

resist peritonitis, should it occur, whilst at the same time the mere draining of fluid from the intestines and surrounding parts would influence for the better the peri-cæcal inflammation? or shall we paralyze and congest, and inflate the bowels by the old-fashioned "splinting" treatment, and thus beckon on peritonitis?

Pain of intense character would often be as much an indication for operative relief as for morphia.

Prompt resolution should take place in cases which are not to go on to the stage of pus formation; and very long continuation of symptoms, or relapses, or recurrences, would be strong indications for surgical interference.

The presence of such tedious recovery, relapse, or recurrence would point to the probable presence of conditions exceedingly dangerous to the patient from liability to general peritonitis or perforation at any time; they further would point, as a rule, to the appendix as the source of irritation and danger. Indeed, in man, that worse than useless appendage must be regarded as the root of most evil in the region under consideration.

To illustrate this point by a single impressive instance, let me quote a case which was reported for me in the *Philadelphia Medical Times* of June 11, 1887. It was that of a woman who, for a long time, had been having mild attacks of abdominal pain, located in the region of the cæcum, which had usually yielded with great promptitude to anodynes. During the course of the last attack of that nature, violent symptoms of perforation and general peritonitis came on. I did not see her until two days after this unfortunate accident; but, though she was then in a most desperate condition, I advised operation as her only chance, and forthwith performed abdominal section. The appendix was found perforated in two places, and violent general purulent peritonitis going on. She died a few hours afterward, but I felt better satisfied that the operation had been performed.

Coming now to our second division, suppose the process to have gone beyond the simple, inflammatory stage, and the presence of pus, even a few drops, to have been diagnosed.

In the great majority of instances, the presence of even a minute amount of pus so near to the peritoneum would be of vastly more risk to the patient than abdominal section for its relief. Hence, I should operate whenever the diagnosis of pus had been made—occasionally even without positive diagnosis. But in this paper diagnosis of distinct conditions is presumed, and I am expected simply to outline treatment for those defined conditions; hence, without qualifica-

tion, I repeat, that pus being present in the region of the cæcum operation is positively indicated.

Many other risks are to be taken rather than those of purulent peritonitis, for early interference will save most if not nearly all cases from this latter dread complication, while the danger of operation becomes slight compared to that of rampant abdominal inflammation.

Local or general peritonitis supervening in a person who has a history of cæcal trouble, or starting during a first attack, would more than justify operation.

At a later or even perhaps chronic stage of the disorder, all available diagnostic skill must be exerted when a peri-cæcal abscess may have pointed in an anomalous situation, and we must ever adhere to the modern surgical rule, always to attack pus at its source if possible. When the cæcum is normally placed, this is always feasible, if the disease be recognized.

Coming now to speak of actual operative measures, the patient, as a matter of course, must be got into the best possible condition, and surgically clean by the usual methods of attempting these ends. Asepsis should rigidly prevail throughout.

The aspirating needle must never be used, for if it does not find pus we cannot be sure that none is present, whilst its own dangers are not inconsiderable. In these cases it is a poor and especially unsafe diagnostic resource.

The abdominal incision should be lateral, *not* median. For if median the peritoneal cavity would often be needlessly opened, and the cæcum and appendix cannot well be reached or dealt with through it. But if lateral it can be made of less size, circumscribed abscesses will frequently be found before the peritoneum is reached, and at its base all necessary manipulations can be made upon the cæcum, appendix, and surrounding parts without opening the peritoneal cavity, whilst should the abscess or ulcer have reached that cavity the intestines, etc., can just as well be examined and cleansed through a lateral as a median incision.

The favored or lateral incision should begin at a point an inch above Poupart's ligament and to the outer side of the right linea semilunaris, be continued in a vertical direction upward about four inches, and carried down through the parietal muscles until pus, cæcum, or peritoneum encircling that organ be reached. Then the wound can be enlarged if necessary. If pus be found, wash its containing cavity clean, and get a clear view and careful examination of the cæcum and appendix. The latter is almost always the seat of trouble, and perhaps

it would be well to excise it whilst we have the chance in any case, for any cæcal trouble would be likely in time to excite disorder of its appendages. Without a doubt it should be so treated if found inflamed, perforated, or harboring a foreign body. This can best be accomplished by ligating it as close as possible to its cæcal attachment and cutting it off, or, if possible, by excising it and then uniting the gaping surfaces with Lembert sutures. Cæcal perforations, if found, should also be closed by Lembert sutures, whilst ulcers, which may be present but have not perforated, should by the same means be turned into the bowel lumen. If the general peritoneal cavity has not been involved, the abscess or cæcum, or what not in view, should be gently curetted, washed out with a one to one thousand bichloride of mercury solution, a large glass or rubber drain introduced, and the abdominal wound closed around it with silk sutures, and a dressing superimposed.

If the peritoneum has become involved and but a short time before the operation, the whole abdominal cavity must be most thoroughly washed out with hot (105° to 110°) distilled water, or one to ten thousand bichloride of mercury solution, and cleansed with sponges, and the foreign body, if that has been the source of trouble, searched for. Should peritonitis be found further advanced the intestines must be withdrawn, and all adhesions parted with the finger or knife during the process of cleansing and before they are returned to the peritoneal cavity. In the case of general peritonitis a glass drain must be carried to the bottom of the pelvis and kept in working order by means of absorbent cotton ropes acting by capillarity. If a second tube is not used for the superficial or peri-cæcal abscess cavity the drain going to the pelvis must have perforations as high in it as the level of the cæcum and any surrounding trouble.

If the inflammation should be caused by the presence of a foreign body in the cæcum itself or by impaction of feces, they must be either excised or urged by prudent force along the bowel. In their operative removal a simple incision, afterward united by Lembert sutures, would answer every purpose.

If portions of the cæcum have sloughed or become gangrenous and the breaches of continuity are too large to approximate with Lembert sutures without producing dangerous constriction of the gut, we will have to content ourselves with the formation of an artificial anus.

Post-operative treatment would consist in keeping the bowels in a fairly soluble condition, the tube clean, and in meeting threatening peritonitis by active purgation.

These same general principles of treatment will hold even for those rare cases of displacement of the cæcum as into scrotal and other, herniæ, its abdominal transposition, etc.; the great question in these cases will be diagnosis.

Typhoid cæcal or appendicular inflammation or perforation likewise should receive identical treatment as for the simple inflammatory disorders of that region. This whole subject is still in its infancy so far as the majority of the profession are concerned, but is of almost boundless promise.

I can terminate this going over the field of cæcal inflammatory disorders, their pathology, diagnosis, and treatment in no better way than by showing to you a patient upon whom I operated, and whose case was reported by Dr. Woodbury in April last. He has been benefited as much by the practical application of the principles of treatment which have been laid down, as any human creature ever can be. His surgical history is as follows:

Charles K., aged twenty-six years, had enjoyed good health until three years ago. Since that time he had been subject to frequently recurring attacks of abdominal pain. They would come on without warning whilst he was apparently well, and completely prostrate him. The pain was of a stabbing character and most severe about the lower abdomen and umbilicus, and was attended with great tenesmus of rectum and irritability of bladder. These attacks, after lasting a few hours, would usually pass off, leaving him in a quite weak condition. During the periods between attacks he kept very well. The last seizure began about April 20th last, when he consulted Dr. Woodbury. He was then haggard, sallow, and constipated; the tongue was heavily coated. Abdominal pain was much complained of. Urine contained much albumen and few casts. He was placed upon the usual medicinal treatment, but steadily grew worse. Two days later his temperature rose to over 103° , pain became very severe, there was much nausea and vomiting, and a distinct hardening, but no tumor could be felt in the right iliac region of the abdomen. These symptoms continued to augment until I saw him three days later, and determined that operation was his best and only chance. At the time of operation his condition was discouragingly wretched—that of a man in the dying stages of general purulent peritonitis. Nevertheless operation was begun and carried to successful termination.

The patient was stimulated and antiseptically cleansed. The incision was made laterally over the seat of induration. The latter had now become slightly prominent. An abscess cavity was entered at

a depth of an inch below the abdominal surface, a free flow of pus took place, and the cæcum and its diseased appendix came into view. A concretion of inspissated fecal material was found alongside that organ, but entirely outside it, and evidently the cause of the whole trouble.

The vermiform appendix was greatly swollen, and exhibited a perforating ulcer three-fourths around its circumference and very near to the point of its cæcal attachment. A silk ligature was applied close to its root and the remainder excised, together with a large portion of omentum which projected into the abscess cavity. The peritoneal cavity was then thoroughly washed out with warm water; for an opening into the general peritoneum was found and through it a quantity of pus had passed into the cavity of the peritoneum.

The abscess walls were then thoroughly curetted, and after a final wash a rubber drain was carried to the bottom of the pelvis and the wound closed about it. Convalescence was uninterrupted from the time of operation; his temperature never again reached 100°, and he has enjoyed perfect health until the present time, when his appearance speaks for itself.

The drain was removed piecemeal; the last portion not until sixteen days after operation.

MEMORANDA

OF THE

LIFE AND WORKS OF BENJAMIN RUSH, M.D.

BY

J. H. MUSSER, M.D.,

OF PHILADELPHIA.

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MEMORANDA OF THE LIFE AND WORKS OF BENJAMIN RUSH, M.D.

BY J. H. MUSSER, M D.,
OF PHILADELPHIA,

AT your bidding, gentlemen of the Society, I am here to-day to review hurriedly with you some features of the career of one of the most remarkable characters in that splendid galaxy of great men who graced the formative part of our national existence.

I can assure you, sirs, the subject is approached with the utmost diffidence and in an absolute sense of inefficiency, particularly augmented when I remember that a master-hand, after reviewing the careers of the most eminent men in the domain of medicine in this city during our early days, made this confession: "With reverend doubt of my powers to do justice to the greatest physician this country has produced, I approach the task of briefly calling to your memory the vivid and emphatic personality of Benjamin Rush." Thus said Weir Mitchell.

I am encouraged, however, to proceed by the hope that many of you may be led by these simple lines to contemplate more earnestly the character and to study more attentively the writings of Rush, and, indeed, of others of our old masters, than we are wont to do in these pell-mell days of practice, practice, practice. While I trust I may not be hoping against hope that of this audience some one may be spurred on to the writing of a biography of our hero commensurate with his greatness. Let it be said, moreover, these memoranda will not be presented in vain, if to others who are led to study the writings of Rush the same pleasure and the same profit is given that I have acquired in my too hasty study of them. Lack of inclination and of efficiency has led me to abjure a critical historical study of Rush or an analytical review of his writings; I shall be content with a flash-light account of him and his works. And first let me say that when we call

him one of the greatest men this country has produced, we speak advisedly, for his death was the cause of public lamentation. Societies went into mourning for him, men like Adams and Jefferson condoled with each other at their loss, while eulogium upon eulogium was pronounced upon his character. During his life, crowned heads paid homage to him, learned societies vied with each other in electing him to their membership, while his fellow-citizens forced upon him positions of honor and profit and responsibility. All this, too, be it remembered, apart from the field of medicine, and not alone because of his greatness as a physician; for Rush was a statesman and patriot; Rush was a scholar and scientist; Rush was a philanthropist and sanitarian; and so of this myriad-minded man it has been said, "taking his whole career, Rush was the larger personage, and surely next to Franklin, the greatest citizen of Pennsylvania." That he was great as a physician we know full well from the positions of medical trust he held as practitioner and teacher, from the enormous practice he acquired, thereby endearing him to thousands of his countrymen, and from the sagacious and philosophical medical writings which he has left to posterity. Epithets like the following have been applied to him by persons who have studied his writings and contemplated his practice: by Lettsom, the "Sydenham of America"; by Hack Tuke, the "Fothergill of America," and, by others, "The American Hippocrates." While content with such testimony as this, I trust your curiosity is sufficiently piqued to bear with me patiently as I more specifically detail some points in this interesting, indeed, almost romantic career.

Benjamin Rush was born in 1745, near Philadelphia. His parents were members of the Society of Friends; they died when Rush was quite young. After a course in the grammar school presided over by his uncle, at West Nottingham, Rush entered Princeton College, from which he graduated in 1760, receiving the Bachelor's degree in his fifteenth year. He was apprenticed to Dr. John Redmond for six years, during which time prevailed the yellow fever epidemic of 1762. Of this epidemic, Rush, then a student only, took notes, which are said to be the only records of the epidemic extant. In 1766 he went to Europe, and, after two years' study, was graduated at Edinburgh, receiving the degree of Doctor of Medicine after publicly defending a written thesis. After a year of study in London and Paris, Rush returned to this country

and assumed the duties of Professor of Chemistry in the then College of Philadelphia. While in Edinburgh, he secured, by personal intervention, the services of Dr. Witherspoon for the presidency of Princeton College, which position that eminent divine had previously declined. Thus Rush was instrumental in serving his *alma mater* and securing to the country one of its subsequently most eminent patriots. In 1789 Rush was elected Professor of the Theory and Practice of Medicine. The College of Philadelphia was merged into the University of Pennsylvania in 1791 and Rush made Professor of the Institutes and Practice of Medicine and Clinical Medicine, and, in 1796, of the Practice of Physic, in addition. These chairs he filled until his death. In 1783 he became one of the Physicians of the Pennsylvania Hospital, which, at that time, included attendance upon the insane. In these wards his studies and observations led to his writings on psychiatry, which have been pronounced masterpieces, and for which he has been called "The Father of American Psychiatry." For thirty years, until the day of his death, he attended upon the wards of the hospital, and, it is said, never missed his daily visit, and scarcely varied a minute from the hour he was accustomed to attend. He, with others, founded the Philadelphia Dispensary in 1786, and attended upon it until his death. He was one of the founders of the College of Physicians in this city in 1787, and an active member until his resignation, which took place in 1793, after a disagreement with members as to the origin of yellow fever during the epidemic of that year. After this, with Physick and others, he stood aloof from the prominent men who composed the College of Physicians, and for a short time, he with them sustained the society known as the Academy of Medicine. Of political positions of honor and trust, Rush held not a few. He was a member of the Continental Congress and the Convention of Pennsylvania which adopted the Federal Constitution. For a short time he was Surgeon-General of the American Army. Just here let me say, in parenthesis, one remarkable phase of the character of Rush presents itself; in the positions of responsibility he was placed, whether by man, as in the Continental Congress in the days that tried men's souls, whereby he became one of the signers of the Declaration of Independence; or by Providence, as in the presence of the most terrible scourge that ever breathed the breath of death and desolation over our then fair and prosperous young city—the yellow fever epidemic—courage of the highest

degree was evinced. It was this same courage, the courage of his convictions, that honesty of purpose, which led him in season and out of season, notwithstanding the bitterest revilings of his fellow-practitioners, to pursue plans of treatment which he deemed correct, or uphold opinions regarding the local origin of yellow fever which drew execrations of all parties upon his head ; it was this same courage, with exalted patriotism, which led him to quarrel with Washington and resign the position of Surgeon-General of the Army. Finally, of political positions, Rush held that of Treasurer of the United States Mint from 1799 until 1813.

In societies for the advancement of knowledge and in educational matters Rush was most active. He was a member and officer, and a contributor to the transactions of the American Philosophical Society. An oration before it, on "An Inquiry into the Influence of Physical Causes upon the Moral Faculty," called forth the highest encomiums from European scientists and societies, and placed his name and fame side by side with those of Franklin. He was one of the founders of Dickinson College of this State, President of the Society for the Abolition of Slavery, and one of the Vice-Presidents of the American Bible Society. When we remember that, with all this, the cares of an enormous practice were added, we are led to exclaim, "What a life of industry was this !" As Mitchell says, "Four careers in one, any one of which would suffice most men."

Of the practice of Rush much could, but little will be said. It was very large and remunerative. In the conduct of it he exhibited the highest type of a physician, not resorting to the tricks of the charlatan, while the sick-room was never a theatre of imposture for him, nor "prescriptions delivered with the pomp and authority of edicts." During the epidemic of yellow fever he was most active. He did not desert the post of duty, but, in spite of domestic sorrow and personal affliction, he continued in his labors, never ending the day without noting the observations he had made. You all know he was a great advocate of bleeding, and that the ever famous "ten and ten," calomel and jalap, was a result of his therapeutical observations. Time forbids detailing the controversies that arose in our early medical history by the adherence to divers plans of treatment. Injustice, however, would be done this kind-hearted, sympathetic gentleman did we not refer for a moment to his kindness to the poor. In one of his addresses he says, "I

shall only add that the poor of any description should be the object of your peculiar care." All through his writings sentiments like these are breathed: "When called to a poor man imagine you hear the voice of the good Samaritan, saying, 'Take care of him and I will repay thee.'" And certainly he was repaid by the satisfaction of doing good as shown by the grief with which a nation mourned his death, while "the people in crowds besought a sight of his face, or, at least, to touch his coffin."

Fortuitous circumstances oftentimes land persons in positions of prominence far above the ratio of their greatness. For any who were thus sceptical regarding Rush on account of such possibilities, his writings are left to attest to his greatness, and it is with pleasure and a sense of obligation for profit derived in their perusal, that I now turn to them after this hasty sketch of his career.

And just here a few thoughts entirely irrelevant arise. Any one who reads the works of our old masters, will not cavil as to the importance of their preservation. The editions of Rush are quite old, the latest 1830, and the copies scarce. What better use could some of the funds of our Society be put to, than the expenditure of a certain sum for the publications of the writings of our early laborers, after they are edited carefully? We would not undertake, serviceable though it would be, to publish all the classics, but certainly we could and should preserve those peculiarly our own, and so take care that future generations are not denied the profit of studying them, while even now, on account of the confinement of the editions to large libraries only, their present restricted use would not be so limited. The edition of the works of Rush that I have consulted, comprised four volumes of inquiries, one of essays, and one of introductory addresses.

Review for a moment, if you please, some conditions of our present social and educational status. Slavery is a matter of history; to growing generations, of tradition. Capital punishment is being abolished in many States. Prohibition is stalking with giant strides over the country. Vassar and Wellesley and kindred schools, voice aloud the progress of the higher education of women. Educators, fearless as President Norton, of Harvard, Huxley, and others, are battering down the rock-ribbed doors of Latin and Greek, and bidding modern languages and sciences enter our college curricula. Universal peace societies are growing and international arbitration is becoming the fashion of the hour. In our own frater-

nity, epidemics are now studied by societies, climate reduced to a handmaid of therapeutics, and old age studied by our most illustrious votaries, both singly and by the new collective method, for the purpose of seeking the conditions Rush sought for, the conditions that contribute to longevity. For all these advances Rush battled. Against slavery, against capital punishment, against intemperance, his voice was heard in no uncertain tones. The higher education of women he thought conducive to the best interests of a large republic, while against excessive study of Latin and Greek, in accordance with the custom of his day, he threw the weight of his opinion. These essays are most interesting, written in a pure style with many scintillations of eloquence and abounding in sound reason and vigorous logic, all set in a wealth of illustration of life and character, drawn from his varied experience, noted on the spot in his omnipresent common-place book. In his inquiries particular attention is paid to climate, while his stories of the epidemics of yellow fever, measles, and influenza are classical. Sixteen lectures make up a separate volume, and while the essays are largely upon economic and social topics, the lectures are largely professional. Veterinary medicine and medical jurisprudence are pleaded for eloquently, while the lectures on professional matters foreshadow the Code of Ethics, and had they been repeated from time to time, and taken to heart, would have rendered unnecessary the appearance of questionable works, like the *Physician Himself*, which rivals a Scott's novel in the avidity with which it is sought for. Read the story of Richardson and Tuke and Mills, who tell of the sagacity and wisdom Rush displays in his works on the mind and on the treatment of insanity, which, with his accounts of the epidemics before referred to, will stand as long as the science of medicine stands. The pathological and therapeutical observations in his inquiries are not now of much interest, although an uncommon nicety of observation is displayed, and an application of the relation of the smallest and most common-place things to the great events of nature, keenly exposed, and one sees in them the forerunner, I take it, of the present plan of treatment of disease, which is the crowning glory of this century, by a study into the relations of things, the environment of the patient, and of the multiplex causes, and hence an adaptation of conditions of life to extraneous conditions.

All this leads me to what should be the practical outcome of these desultory remarks. It is true, the pathway is crooked, and, indeed,

oft very narrow. Fortunately, it rests upon a broad foundation of a character of invincible courage, the rugged honesty in which humane feelings were incarnate. It is not for me to detail to you, gentlemen, the value and importance of engraving on tablets of brass, or recording on blocks of marble, the achievements of our fellows. You know full well, in all ages and all races, such has been the custom and the privilege. In this country we have not been insensible to the importance of thus honoring our worthies. To patriots, statesmen, warriors, men of science and men of letters, lawyers and ministers, without reluctance, due homage has been paid in this way, either by communities at large or by respective members of the profession. The profession of medicine, save to local names, has never by an act of this kind exhibited to the world at large the jealous regard it has for its nobility nor shown to mankind in voice of imperishable stone any appreciation of the noble qualities for which our guild is justly famed.

Let us, therefore, honor ourselves by honoring him, whose imperishable spirit should ever remain before us an incentive, an example.

“Here, all language fails;
Come, then, expressive silence, muse his praise.”

With
Comments

CASE OF TUBERCULAR PERICARDITIS;
UNUSUAL AMOUNT OF EFFUSION;
ACCIDENTAL PARACENTESIS PERICARDII.

NOTES OF THE TREATMENT OF PERITONITIS.

BY

JOHN H. MUSSER, M.D.,

INSTRUCTOR IN CLINICAL MEDICINE IN THE UNIVERSITY OF PENNSYLVANIA;
PHYSICIAN TO THE PHILADELPHIA AND PRESBYTERIAN HOSPITALS.



REPRINT FROM TRANSACTIONS.

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By JOHN H. MUSSER, M.D.,
INSTRUCTOR IN CLINICAL MEDICINE IN THE UNIVERSITY OF PENNSYLVANIA;
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[Read November 3, 1888.]

THE patient, a colored man, twenty years of age, was admitted into the medical wards of the Philadelphia Hospital in the fifth week of his fatal illness. A farmer by occupation, he had never used stimulants, nor had acquired any form of venereal disease. He had never been sick, nor have any members of his immediate family had any illness.

Some four weeks prior to admission J. G. began to suffer from a harassing night cough and from dyspnœa. With the inception of the cough and dyspnœa, *i. e.*, in the first week of his illness, fever with irregular chills is recalled, while vomiting was marked for three days. The dyspnœa was most pronounced; increased progressively, and on account of it alone he applied for treatment, having continued at work until four days previously.

Status præsens.—Admitted November 30, 1887. Refused to go to bed because he could not breathe; examined in his chair. Emaciated, though has the frame of a burly negro; temperature 103°; skin hot; large drops of perspiration on brow; extremities most and cool; no œdema; extreme orthopnœa, all extrinsic respiratory muscles acting vigorously; epigastrium

very full and tender on pressure; recti muscles above umbilicus very hard and prominent; no alteration of abdominal respiratory rhythm; face anxious and pinched; veins of neck full and undulating.

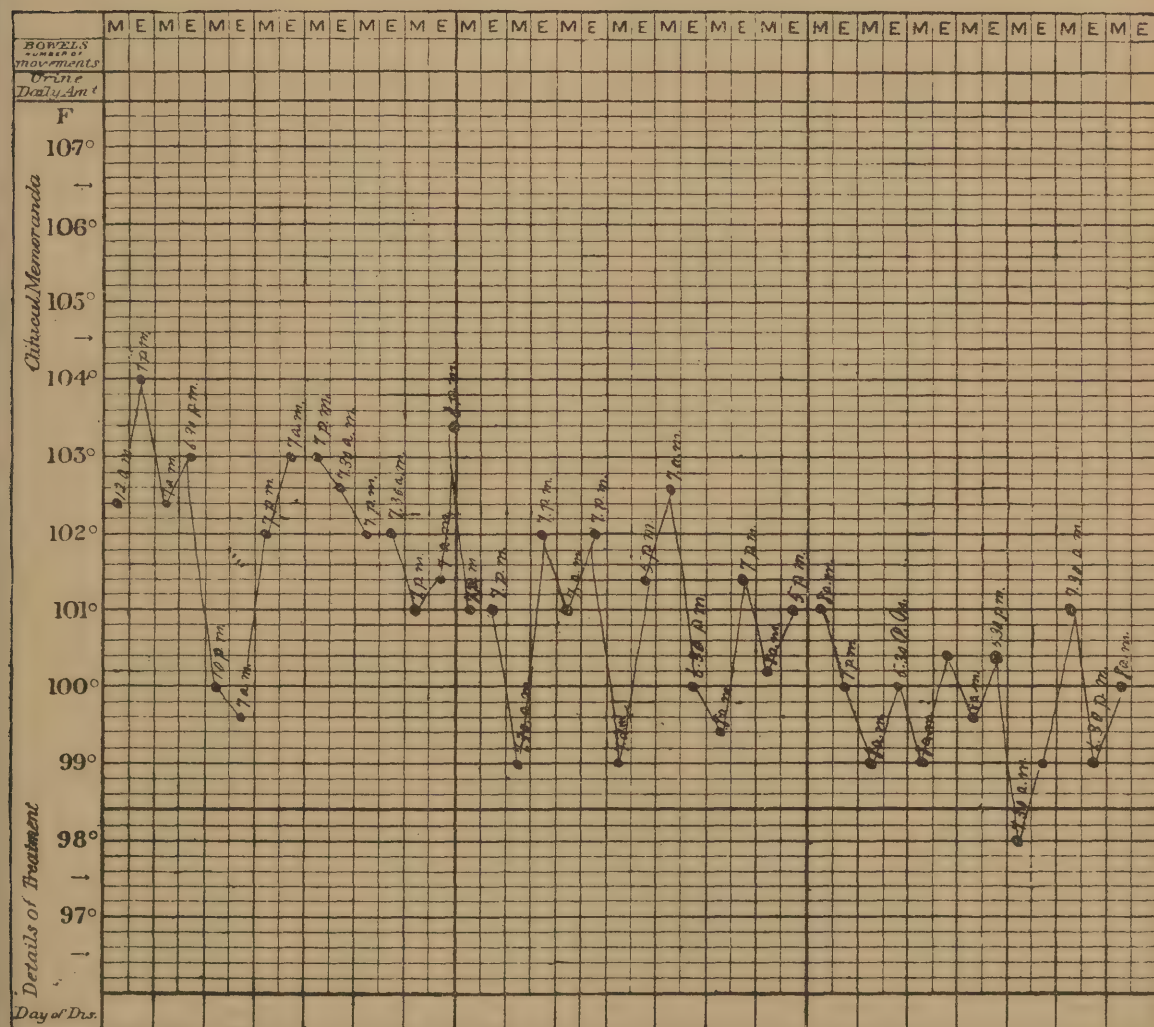
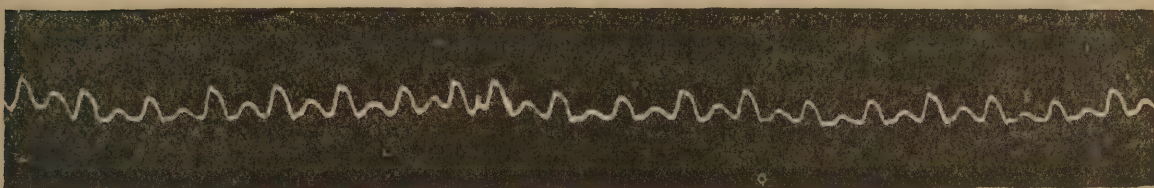
Examination of thorax; inspection.—Undue prominence of the præcordial region; intercostal spaces of left thorax full; expansion of left side anteriorly, laterally, and posteriorly, much lessened; marked expansion below both clavicles; apex beat of heart and cardiac impulse absent.

Palpation.—Confirms inspection; no thrill over heart or in vessels; vocal fremitus increased in first interspace left side, lessened in second, and absent below third and in axilla; posteriorly, above scapular spine increased, below diminished, and from angle of scapula, absent; pulse small, feeble, extremely rapid, compressible, and irregular.

Percussion.—From second rib left anteriorly to margin of ribs, dulness; from fourth rib in axilla to eighth rib, dulness; flat from fourth to seventh; semi-dull from seventh to eighth; and below eighth tympanitic. Absolute dulness behind the sternum, from opposite first interspace to xiphoid; the dulness extends one inch to the right of the sternum in the second interspace, two inches in the third, and three and one-half inches, or to the right nipple line, in the fourth and fifth interspaces. Posteriorly, dulness from middle of scapula to base of thorax in angle line; along the vertebra, from seventh to ninth, over an area two inches long and two wide, tympany. Above the eighth rib, from scapular line to axillary region, flatness. Right lung resonant.

Auscultation.—Absence of first sound of heart; second sound feeble at base. Exaggerated breathing in first and second left interspaces; absent breathing below and in axilla. Posteriorly, along vertebra from spine of scapula, bronchial breathing and bronchophony, increasing downward and very marked one inch from spinal column, opposite angle of scapula, where the tympany (on percussion), most marked. In line of angle, breathing exaggerated above spine, lessened below, and quite feeble and distant at the angle, lessening to base. Increased

respiratory murmur all over right lung, much increased in third and fourth interspaces.



Tongue white-furred; appetite poor; deglutition difficult at times; some nausea; bowels regular; liver and spleen not enlarged; cough not marked; some laryngeal stridor in occasional paroxysms; voice clear; answers questions slowly; some delirium at night; urine scanty, high colored, without casts or blood, but with albumen in small amounts.

On account of the extreme dyspnœa the thorax was aspirated in the sixth interspace in the anterior axillary line, and thirty-seven ounces of bloody fluid were withdrawn at this time, presumably from the pleural cavity. Some relief was afforded, but the patient could not assume the semi-recumbent posture until six days after the tapping. Four hours after the aspiration resonance returned in the second and third left interspaces, and the respiratory murmur became audible. The next day a distinct pericardial friction could be heard to the right of the sternum. Four days after aspiration the physical signs were the same as before the tapping, and during the rest of his life continued the same. The further progress of the disease was rapidly downward to death. Fever, profuse sweats, extreme exhaustion, great emaciation, night delirium, and continuous dyspnœa marked the course. The heart's action became irregular and feeble, and death took place from its failure (December 21, 1887) eight weeks after the disease began.

At the autopsy the pericardial sac was found to be distended by sixty-four ounces of bloody serum. The heart was covered with lymph and the parietal pericardium studded with tubercles. The visceral pericarditis was tubercular. The left pleura and left lung were the seat of miliary tubercle; a few were found in the right lung also. The bronchial glands were enlarged and caseous, and evidently were the original foci of the tubercle bacillus. The spleen and kidney contained hemorrhagic infarcts.

Lack of space forbids more than a summary of the many interesting features of this case, of which the interest centres in the diagnosis. During life it was

thought the patient had a tubercular pleurisy and pericarditis. The autopsy showed the presence of a tubercular pericarditis alone. The physical signs of a pleural effusion, which could be elicited in the anterior, the axillary, and the middle and lower posterior region of the left thorax, appeared to confirm our notion of the presence of fluid in the pleural cavity, with adhesion of the lower lobe of the left lung posteriorly. A pericardial effusion was also thought to be present, because of the absence of the apex beat and impulse not only in its usual position, but also in the position in which it is usually found in large left pleural effusions; because of the increased area of dulness to the right; because of the pericardial friction sound; because of the enfeebled heart sounds; and because of the extreme dyspnœa. Moreover, it was thought, and the autopsy proved the correctness of the view, that an active inflammation of the pericardium was present, because of the early vomiting, the epigastric pain and tenderness, the occurrence of delirium and of a moderate amount of albuminuria, and the excessively rapid and weak pulse. The pressure symptoms of a large pericardial effusion, laryngeal stridor, and difficult deglutition, though transient, lent color to this opinion.

The extremely large pericardial effusion was the cause of the physical signs which simulated a pleural effusion. In the light of the autopsy, in a like case, a pleural effusion might be excluded, if the lower limit of dulness in the axilla did not fall below the eighth rib, and if some resonance and respiratory murmur should be present under the clavicle, and at the same time the physical signs of a compressed, partially collapsed lung could be determined posteriorly. Such conditions were present in

this instance, and, we take, it the right limit of tympany in the axillary region is good proof of the absence of an abundant, non-localized pleural effusion. That the process was tubercular seemed clear, because of the high temperature, exhaustion, profuse sweats, and rapid emaciation.

Tubercular pericarditis is rare, and extremely rare when associated with an enormous effusion. We are unfamiliar with the records of pericarditis of any form with so large an effusion. It is interesting to note the infection of this serous membrane and the lungs from the caseating tubercular bronchial glands.

NOTES ON THE TREATMENT OF PERITONITIS.

By JOHN H. MUSSER, M.D.,

PHYSICIAN TO THE PHILADELPHIA AND PRESBYTERIAN HOSPITALS.

[Read January 2, 1889.]

THE following brief notes of some cases of peritonitis are given in order to call attention to the successful medicinal treatment of this disease in contradistinction to its surgical treatment. One cannot but look askance at the extraordinary surgical activity that prevails. It is possibly very well for the *experienced* abdominal surgeon to act in accordance with his convictions, particularly when in his skilful hands recovery takes place even if the operation has or has not been indicated. It is not well for him to *teach* that such measures must be resorted to in the larger proportion of cases. We are not all laparotomists, and hence a very large number of cases, particularly away from the surgical centres, must be treated by other means. The writer speaks by the card when he says the belief is very prevalent, particularly among the younger members of the profession, that surgical means alone avail. To attempt to restore confidence in medical means of treatment, to remove distrust, and to protest against one-sided lines of thought, is the object of these notes.

In addition, in order to show that the writer relies not on medical resources alone, and for their peculiar intrinsic interest, notes of a few cases which had to be operated on are included.

The patients herein classified occurred in the writer's private practice; the hospital cases and the cases seen in consultation are not recorded. Twenty-nine cases are noted: six males

under fifteen, four male adults; one girl, aged six, and eighteen female adults. Seven of the female adults were puerperal cases, of which three died. There were no other deaths. If the puerperal cases are excluded, twenty-two cases remain, with no deaths. This does not include the large number of cases of localized peritonitis or pelvic cellulitis which it falls to the lot of every practitioner to treat.

PUERPERAL CASES.—All may be considered of septic origin, although undoubtedly previous tubal disease (gonorrhœal) existed in three of the cases, two of which died, one in fact of these recovering from the peritoneal inflammation to succumb to pleuro-pneumonia.

CASE I.—Primipara, æt. forty-two, contracted pelvis, craniotomy, furious general septic peritonitis. Recovery.

CASE II.—Multipara, æt. thirty-four, septic peritonitis, fever, sweats, and local symptoms, extreme prostration. Recovery.

CASE III.—Multipara (see below), æt. twenty-eight, septic peritonitis, enormous effusion, great hectic, and exhaustion. Recovery after aspiration.

CASE IV.—Multipara (see below), æt. twenty-four. Recovery.

CASE V.—Multipara, æt. thirty-eight, peritonitis, cause unknown. Throughout pregnancy premonitions of death, which took place on sixth day.

CASE VI.—Xpara, æt. twenty-four. Prior to and during pregnancy symptoms of right tubal disease. Labor natural. Peritonitis, beginning in right iliac fossa on third day. Death on sixth day. Husband had gonorrhœa.

CASE VII.—Xpara (see below), æt. thirty-seven. Labor natural. Long continued right side tubal disease. Husband dissolute. No history of gonorrhœa. Peritonitis began second day. Relief to all abdominal symptoms. Death, twelfth day, of double pleuro-pneumonia.

Of the four recoveries, a laparotomy saved one (Case IV.); of the three deaths, a laparotomy could possibly have saved one (Case VI.); there was no indication for abdominal section in one (Case V.); and neither medical nor surgical means could have saved the other (Case VII.). Indeed, the latter might justly be excluded or placed among the cured as far as peritonitis is concerned. After the recovery of the three, who were desperately ill, without abdominal section, one cannot but feel great confidence in nature's efforts, combined with judicious medical aid. The remaining cases were secondary to local abdominal disease

of three varieties: disease of the ovaries or tubes (eight cases); disease of the appendix (thirteen cases); and disease of the biliary passages (one case). Operative interference was resorted to in three instances; in two, for the primary acute attacks; and in one instance peritonitis ensued *after* a laparotomy for pyo-salpinx.

CASE VIII.—Female, æt. thirty-eight; married. Severe local pain, tenderness, and fever, etc., early recognized to be due to an ovarian cyst, which had rotated on its pedicle. Laparotomy by Dr. Parrish. Cyst almost gangrenous. Extensive peritonitis present. Recovery. (Reported by Dr. Parrish in the *Obstet. Soc. Trans.*, Philadelphia.)

CASE IX.—Female, æt. thirty-four; single. Appendicitis. Two attacks of local and general peritonitis. Subsequently tumor, and Parker operation by Dr. Porter in the Presbyterian Hospital. Recovery.

CASE X.—Male, æt. twenty-one. Appendicitis and peritonitis. Early recognition. Parker operation by Dr. Keen. Recovery. Of all the cases this one least merits to be classified among cases of general peritonitis. He was gravely ill, however.

CASE XI.—Here a pus-tube had been recognized by rational symptoms and physical signs. Female, æt. thirty-three. Dr. Price operated with his usual skill and care. A large pus-sac was opened, and possibly the peritoneum infected. Certainly a very severe peritonitis ensued, which was relieved by salines. The operation was not done to relieve peritonitis, while the inflammation was combated by medicinal means. The case, therefore, is placed under the non-operative list.

Nineteen cases remain, treated without operation. Eleven of these were secondary to appendix disease (six boys, one girl, two male adults, and two female adults); seven to disease in the pelvis, and one to inflammation of the biliary passages. Five of the cases of typhlitis were very grave; two had severe second attacks, and the temptation to resort to operative interference was great. Two of the pelvic cases were also very serious. Space will not permit detailing them.

SUMMARY.

Total cases	29
“ deaths, including pleuro-pneumonia	3
No. of puerperal cases	7
“ “ deaths	3
“ “ non-puerperal cases	22
“ “ deaths	0

No. of times laparotomy or other surgical means employed :

In puerperal cases	1
“ non-puerperal cases	3
Total	4
No. of deaths from laparotomy, etc., ...	0
“ “ recoveries without operation—non-puerperal	19
“ “ “ “ “ puerperal	3

In short, of twenty-two cases, three-fourths, certainly one-half of which were desperately ill, recovered from peritonitis, operative interference being necessary in three only.

METHOD OF TREATMENT.—1. Local bloodletting until pain is very much relieved. Better too much than too little blood abstracted. Three to fifteen Swedish leeches, according to age. If in progress more than forty-eight hours, a large blister. Both of the above to be followed by hot applications, stimulating liniments, as turpentine stupes, if bleeding or blisters not used.

2. Liquid diet absolutely, stimulants administered freely to prevent collapse, to lessen its severity, and to prevent tympany. In severe cases whiskey and water alone, until the most urgent symptoms subside. Cracked ice, lime-water, champagne, iced, are used for thirst or vomiting, but their value is questionable; indeed, sips of hot water or hot whiskey and water are generally preferable. Freshly made koumiss has been of wonderful service, even after vomiting has set in.

3. Calomel in small doses, hourly, until the bowels are moved; then combined with opium in small amounts, to prevent diarrhœa, until ptyalism is secured. If the evacuations produce relief, as is often the case, the ptyalism need not be induced. One-eighth to one-half of a grain of the calomel is used, and has the advantage of being retained usually even if vomiting is obstinate, while it frequently allays this troublesome and weakening symptom. Inunction may be required for mercurialization.

4. If seen early, aconite to children and veratrum viride to adults is given until the pulse-rate is lessened. With veratrum

particularly a cool moist skin, a lower pulse-rate and fall of temperature, which should be brought about in twenty-four to forty-eight hours, are followed by relief to the local symptoms. Three to six drops of the veratrum (fluid extract) hourly usually suffice.

5. To relieve pain, morphia, hypodermically, in small doses, as infrequently as possible. It seems better to combine atropia with it for obvious reasons. Twice daily often suffices, with one-fourth, one-eighth, or one-twelfth of a grain. When an opiate is combined with calomel the morphia can be withdrawn generally. If morphia disagrees, as one often finds it to do, codeia will often suffice, given by the methods suggested by Brunton.

6. If the bowels are not opened in forty-eight hours by the calomel, if the case is not one of strangulated hernia or acute obstruction of the bowel by a twist or by adhesion by a band, an enema of warm sweet-oil (Oj), and then of tepid water are used with extreme care. It is undoubtedly of service to have the bowels moved as soon as possible. That peristalsis does not do as much harm as is usually taught we know, because diarrhœa attends some cases of peritonitis, as we have seen more particularly in peri-cæcal abscess. Moreover, accumulations of gas are prevented, a thing highly desired. Indeed, it may be put down as a cardinal rule in therapeutics that in all affections of or about the tubes or channels, a patulous state of the canal must be obtained if possible.

7. There is no doubt, even when on the verge of collapse, that life can be saved by persistent and active stimulating medication. This must usually be by subcutaneous injection. Whiskey, digitalis, atropia, and amyl nitrite all have been of service.

INDICATIONS FOR OPERATIVE INTERFERENCE.

The writer seems justified in presenting the following suggestive conditions for operative interference from a study of hospital and private cases, and cases seen in consultation. They

may not be complete, but they have had practical exemplification in his hands:

1. Cases of fulminating peritonitis. Rapid advances of all symptoms, and particularly of excessive tympany, vomiting, rapid, feeble pulse, and undue restlessness. Operative measures are urgent, especially if it is the second attack, or if a primary local peritonitis has occurred beforehand.

2. Cases in which collapse is growing imminent in spite of treatment. The peculiar vomiting and a rapid pulse, growing feebler, with low temperature, are suggestive.

3. Cases in which pus is present in the peritoneal cavity or adjacent to it, as indicated by

(a). The presence of a tumor, presumably containing pus, either on external examination or by rectal or vaginal examination. Edema over a tumor is important.

(b). The general phenomena indicative of retained pus. The classical symptoms of hectic need not be present. Night-sweating alone may be a sufficient or markedly suggestive indication of hectic.

4. Cases with grave symptoms, the antecedent history or the early symptoms of which point to retention or septic inflammation of the appendix, the biliary passages, or of the tubes. Previous gall-stones, gonorrhœa in the female, typhoid fever, appendicitis, or intestinal perforation, are weighty matters in favor of an operation. Ulcer of the stomach or bowels belongs to this class.

5. Peritonitis, due to intestinal obstruction, as by hernia, twists, intussusception, etc., not relieved in twenty-four hours, requires laparotomy by all means.

6. There is, in cases that are fatal, a general appearance of the patient and a mental state often of restless apathy, which is so hard to describe, but when once seen is never forgotten, which intuitively leads one to prognosticate death. These cases should be given the benefit of every measure; and certainly in one instance a laparotomy, under these circumstances, saved life.

7. Age is an important factor. A young person or child can be more ill and recover from a peritonitis more rapidly than an

old one. An operation at this age can be done later in the case, with more hopes of success, than in an adult over forty.

8. Are there any symptoms, the presence or absence of which would help one to arrive at any conclusion? The rapid, thready pulse, the painless watery outpouring from the stomach, the apparent indifference to the gravity of his condition, even when in collapse, with unclouded intellect, which the patient has; the presence of pus, causing threatening symptoms, have been referred to. The absence of pain after the first forty-eight or seventy-two hours, either on movement or pressure; the absence of tympany, and the suppression of the urine are grave phenomena. Instead of distention, the abdomen is sometimes flat, and on palpation the walls are rigid and present a board-like hardness. In two obscure cases this rigidity of the muscles was the strongest evidence of acute suppurative peritonitis, which the autopsy unhappily proved to be present. Without these phenomena the disease could not have been positively recognized, and in fact its presence was disputed by the colleagues in consultation.

Sometimes we are morally certain of the presence of pus, as shown by mild hectic, and yet we cannot localize it. If the general symptoms are not alarming we can wait. One of the above patients was not operated on until five months after the first attack of peritonitis had subsided. Throughout this time irregular chills, fever, and sweats occurred; and pain in the right inguinal region led to the recognition of a slowly developing tumor, which Dr. Porter successfully opened.

Some of the above cases presented some features of interest, which will be briefly detailed.

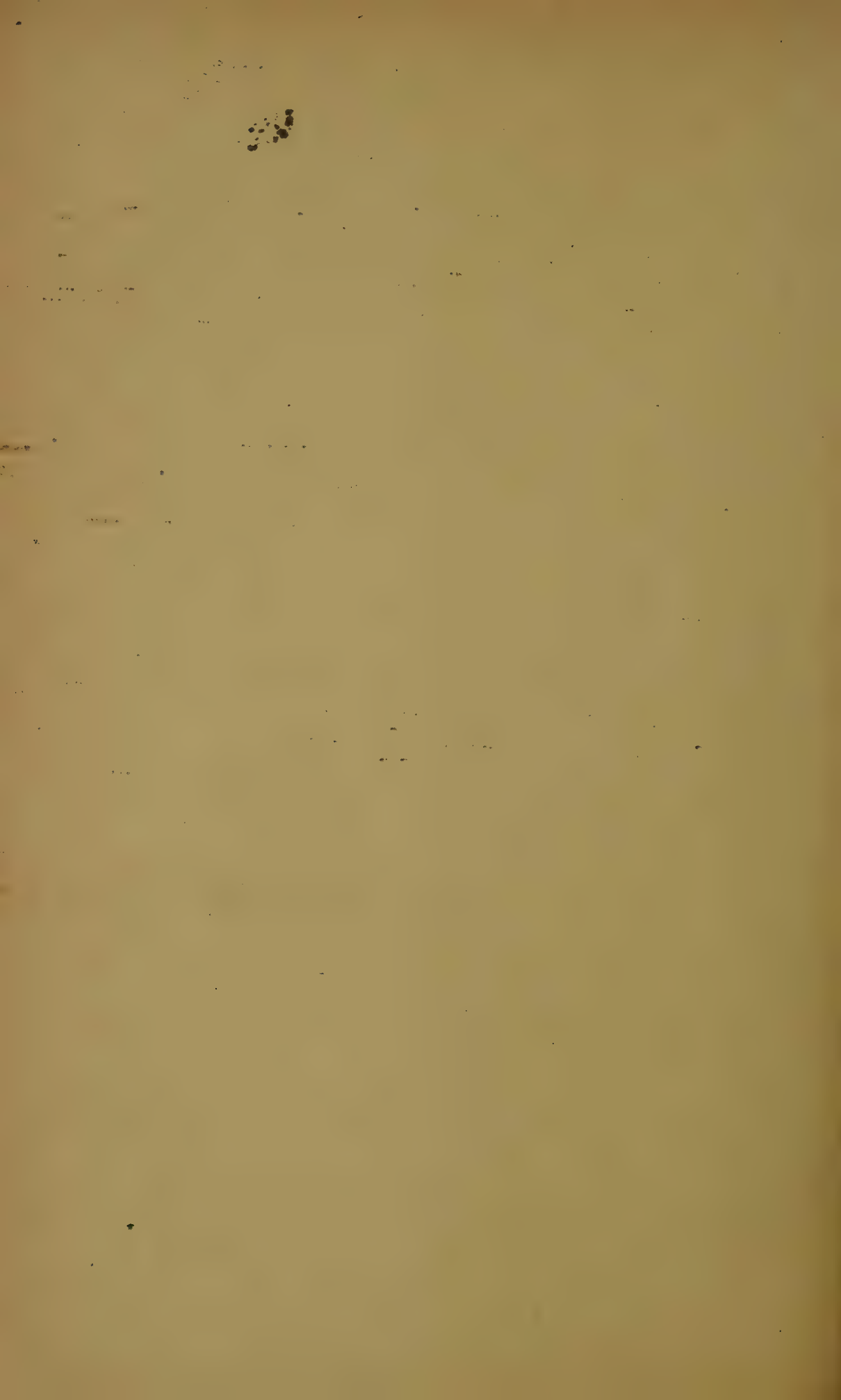
1. (CASE III. above.)—The writer was called on tenth day after patient's confinement and the seventh of her illness. Much prostrated, extremely anæmic, pulse thready, sweats profuse, temperature high, general abdominal pain and tenderness. Abdomen distended very much by fluid. Laparotomy advised, but absolutely refused. After five days of futile treatment, save success in checking the flagging strength by stimulants, the abdomen was tapped with the ordinary trocar and canula, exploratory tapping having been done before with a hypodermic syringe. The fluid was thus removed in this unscientific way, because it seemed impossible to the

writer that absorption of the large amount could take place, and hence it was the only chance, short of abdominal section, to save the life of the patient. A large wooden pailful and a half of a bloody purulent fluid was removed, my friend, Dr. Wm. Gross, assisting. Fifteen days afterward the patient was about the room, but for a long time the abdomen was extremely tender, and not until ten days after the operation did hectic cease.

One almost marvels, considering the character of the effusion, at the cure. Such it was, however, and while not brilliant, it was complete. By the trocar not all of the fluid could have been withdrawn, and hence, to nature's means of curing these cases, much was left. The eminent interest of the case, therefore, is in the fact that cases of peritonitis, with purulent effusion, will get well even under the most unfavorable circumstances. The poor woman had not the advantages of good nursing, good hygienic surroundings, and good food. Pluck and good whiskey alone favored her. This case is recorded more particularly to show that we can probably oftener withhold the knife than we do, and also to give courage to those whose patients cannot have the presence of the skilled surgeon. It is not to advocate such a plan of treatment.

2. (CASE IV. above.)—Female, æt. twenty-four. Natural labor completed before the arrival of the physician. On the second day local pain, gradually increasing, with the formation of a tumor in the region of the right ovary. Great hectic and exhaustion. Ten days after confinement laparotomy by Dr. Price. Recovery.

This is an illustration of the advantage of surgical aid and of the value of operating even in the early puerperium.



THE USES OF FEVER HEAT; THE OCCASIONAL DANGERS OF ANTIPYRETICS IN TYPHOID FEVER.

By J. H. MUSSER, M.D.

[Read February 3, 1892.]

ANIMAL heat serves a physiological purpose in the economy. When the degree of heat is beyond the limits of the norm its effects are not physiological. In health normal heat is a stimulus essential to the carrying on of physiological processes. Without it the nerve-centres controlling respiration, circulation, and other processes are dormant. No stretching of the imagination is necessary to conceive of such an impairment of the vital forces that increased heat or pyrexia may be essential as a stimulus to enfeebled nerve-centres.

The following observation impressed the writer with the usefulness of fever as a vital stimulant.

The patient, two years old, was ill of whooping-cough and its graver pulmonary complications—capillary bronchitis and atelectasis. Exhaustion was extreme on account of her long illness of three months. Fever was marked. During the last week of her illness death was daily, then hourly expected. The hands and feet became cold, the face pale, the respirations excessively rapid and feeble (100 to 110), the pulse feeble and irregular and so rapid it could scarcely be counted; a cold sweat bathed the brow, while stupor was present. These grave symptoms were first observed in the mornings. The temperature would be 100° to 101° F. at this time. As the day advanced the usual afternoon exacerbation of fever took place. With such degree of heat came evidences of renewed strength. The extremities warmed, the color brightened, the respirations were less labored, the pulse became perceptibly stronger and fuller and more regular; intelligence was restored; food, though refused before, was now taken with avidity, and even

asked for, and notice taken of objects and events. Hope was restored, to fall again as the thermometer went down.

At first these paroxysms of heat-exacerbation and stimulation took place daily. In the last three days of the child's illness, they took place every two or three hours. Indeed, during the period of lowered temperature, so depressed and feeble was the child that momentarily death was looked for. As the temperature rose—but not until it was above normal for some time—the grave symptoms disappeared. These hourly heat-paroxysms were closely watched, and to no other cause than the stimulus of heat could the revivals of strength and increased functional activity of the circulatory and respiratory apparatus be attributed. It is difficult to picture, and was certainly a most striking exhibition of the play of heat-centres in the phenomena of life. Finally after the stage of exhaustion they had undergone, the heat-centres did not respond to the unknown stimuli, the temperature did not rise, and gradually all function ceased.

I wished more particularly to place this observation on record in order that in these times when so much is said about the use of antipyretics, the dangers of fever, and the necessity of reducing temperature, we should bear in mind that high temperature may have a physiological use in the economy at certain times. I am well aware that certain German and French writers have held that high temperature is a conservative process, particularly in septic conditions through its effect upon the bacteria or the poisons generated by them. But, independent of this action, fever serves quite a physiological use in the economy. This is the only observation that I wish to record in regard to the usefulness of fever.

The following remarks are addressed to practitioners who continue to use, and think they must use, antipyretic medicines in typhoid fever because the thermometer records high temperatures. I have never used such means to reduce temperature in this disease, but I wish to impress particularly upon those who will use antifebrile drugs that it is essential they should hold their hands at least at times. The present intemperance in the use of antipyretics is due to laudation of this class of drugs by eminent therapeutists in days gone by.

Now in regard to the occasional danger of the use of antipyretics in certain cases of typhoid fever. There are three periods in the course of typhoid fever when, without doubt,

the use of antipyretics is dangerous, and these must be carefully considered. First, in the early or middle period of cases which come to us after removal from a distance. Sir William Jenner was the first to lay great stress upon the danger of the removal of a patient suffering with typhoid fever. Anyone who observes cases in the medical ward of a hospital will notice that the temperature for the first twenty-four hours after admission is unusually high—that is, higher than one would expect at the period that the disease has reached. This rise of temperature is undoubtedly due to the exhaustion that has taken place on account of the removal to the institution. I have seen this so often and made so many observations in connection with it that I hesitate to use any antipyretic during the first twenty-four hours after admission. The records which I have bear out the correctness of this course. Even if no antipyretic is given, the temperature usually falls to the proper point in twenty-four hours. Sometimes stimulants are required, and under their use the temperature falls. On the other hand, I have seen cases which had been admitted with a temperature of 105° or 105.5° , to whom an antipyretic was given by the resident with serious results. I am so sure of the inadvisability of administering an antipyretic under these circumstances that it is a standing instruction in my wards that no antipyretic be given during the first twenty-four hours after admission; but that stimulants shall be administered.

Again, there are certain cases in which peculiar idiosyncrasies exist, where it is inadmissible to use antipyretics during the course of typhoid fever, no matter how high the temperature may be, if life is not threatened. One such case comes to my mind among a number of others. We have all seen cases which were particularly susceptible to drugs, to the application of external cold, to any kind of stimulant, and to opiates or alcohol in any form. The case which I have in mind is that of a young woman who was in the private ward of the Presbyterian Hospital, with typhoid fever running a regular course, but with excessively high temperature. It was impossible to administer any antipyretic. She was extraordinarily suscep-

tible to quinine, one grain producing serious nervous symptoms. The use of alcohol caused increased headache and violent nervous symptoms. The external application of cold and the external use of alcohol or other refrigerants produced shivering and great depression. Without my orders, on one occasion five grains of antipyrin were administered and such serious collapse ensued that it required the efforts of three of the internes for five hours to restore the patient to her natural temperature, and, in fact, to save her life. It was the most extraordinary degree of depression that I have seen from a single administration of any drug. The above is an example of a number of cases in which it is impossible to administer antipyretics. This is due to peculiarities of individual constitution. I think that physicians who are constantly calling attention to the use of antipyretics neglect to look for these peculiarities, which are present in cases frequently seen in private practice. I have now under observation an individual of highly nervous temperament, to whom I would not administer an antipyretic unless life was absolutely threatened.

It is in the later stages of typhoid fever that I think antipyretics are especially dangerous, and must be administered with the greatest care. Two classes of such cases are worthy of attention. There is one class in which the temperature persistently keeps up to the full height, but there is abatement of all the other symptoms; lessening of the diarrhœa, cleaning of the tongue, diminution of the delirium, and even lowering of the pulse with increase of strength. We feel that the typhoid process is ended, but the fever nevertheless continues high. I will illustrate this with brief reports of two cases. In the first case, that of a lad ten years of age whom I attended during the course of an attack of typhoid fever, from the fifteenth to the eighteenth day of the disease the temperature ranged between 104° and 105.5° . The tongue had become clean, the stools had lessened in number and were gradually becoming formed, and I felt that the pathological process was at an end, and that if we waited a little the fever would probably fall. There was no dangerous symptom except the high fever. At

ten o'clock on the evening of the eighteenth day the temperature was 105° , and then began to fall until, at six o'clock in the morning, it was just below 96° , and required all the efforts of the father and the nurse to prevent what they thought to be a fatal collapse. The temperature remained below 96° for an hour, then began to rise, and by nine o'clock in the evening it was 104° . It remained at about this point for two hours, and then gradually fell until in the morning it was 96.5° . It then rose again, to be followed by another fall, but not to such a low point. There is no way in which this fall in temperature could have been anticipated. If we had applied external cold or administered an internal antipyretic I am quite sure that the collapse which occurred naturally would have been a fatal one. This sudden fall often occurs in typhoid fever in children, and it is one of the ways in which the fever subsides, the disease terminating by crisis.

In the second case—that of a young man aged seventeen years, who was treated in the private wards of the University Hospital a year ago, and who had a prolonged and severe attack of typhoid fever, the temperature keeping high—without warning or apparent cause a “nervous chill” occurred, followed by a great fall of temperature from 104.4° to 95.5° , the thermometer rising again to its former degree. The temperature kept thus for five or six days, and then gradually fell. I know of no way in which that fall of temperature could have been anticipated. I know that we were much tempted to use some active means to reduce the temperature, but, had this been done, it might have been serious for the patient.

I recently treated, in the Presbyterian Hospital, a man aged twenty-six years in whom the disease ran a perfectly normal course. He was treated with turpentine. The symptoms while grave were not alarming, and the temperature ranged between 103° and 104° . At one of my visits I found a falling temperature, which continued until the mercury registered 96.5° , being followed by a gradual rise with a subsequent decline by lysis. This is another case in which no one could have anticipated the fall of temperature, which, I am sure, was

a part of the disease, and not due to any cause which would produce collapse.

These three cases are examples that I have taken at random from an abundance of typhoid fever notes in which the administration of an antipyretic in the later stages of the disease would have been dangerous.

Of course there is still another class of cases in which it would be dangerous to administer an antipyretic; that is, the class of cases to which Dr. Da Costa particularly has called attention, namely: cases in which the morbid process has terminated, but—on account of the exhaustion, or the long continuance in bed, or the limited diet—the temperature keeps up, or even begins to rise. Such a case was under my care last year. These have been spoken of as cases of bed-fever, and in these cases the administration of an antipyretic would not have the desired result. In these cases the fever is due to exhaustion, lack of food, and long continuance in bed. The use of stimulants, solid food, and getting the patient out of bed bring back the temperature to the normal.

The above are the classes of cases to which I wished to call particular attention in connection with the sometime danger of antipyretics in typhoid fever. I bring this essay to the College as much for criticism as for discussion, and, finally, in order to say that if physicians *will* give antipyretics in typhoid fever, let them be careful not to administer these drugs in the class of cases or under the conditions to which attention has here been called.

DISCUSSION.

DR. H. C. WOOD: I am inclined to think that the use of internal antipyretics is unnecessary and dangerous in typhoid fever. I do not believe, however, that the sudden collapse which is set down to the antipyretic is the direct or the immediate outcome of the action of these drugs. I am very sure that antipyrin itself is not a depressant to the heart. I have connected the needle of the cardiometer with a large artery of a dog with septic fever, and had it writing on the drum. Then I have given antipyrin in sufficient doses to reduce the temperature five or six degrees, and have found that the

writing on the drum was exactly as before. The fall of temperature had been accompanied by no appreciable depression of arterial pressure. I think that it is the fall of temperature which produces the collapse, due to the withdrawal of the stimulus of the heat. I cannot agree with Dr. Musser that it would be unsafe to have used external cold in the cases which he has mentioned. I believe that the cases would have recovered better if external cold and heat had been used properly. I believe that cases of typhoid disease die because the profession does not understand the proper use of external heat. If the case he mentioned, in which the temperature reached 105° , had had cold water applied earlier, I do not think that the temperature would have reached this point, and, therefore, the system would have been less exhausted, and the secondary fall would not have occurred. The proper use of external heat can always control these falls of temperature, but the method of employing hot-water bottles, hot bricks, and the like, is futile. I believe that by the use of the ordinary water-bed three-fourths full of hot water it would be possible to heat a corpse. A few days ago I had a case which illustrated this. A feeble gentleman, the subject of chronic enteritis, was at the end of the third week of typhoid fever. One morning I found that the temperature was 97° and falling. Hot water was scarce in the house, as the boiler was out of order, and in the forty minutes during which we were heating the water the temperature had fallen two degrees. The man had not been on the bed more than twenty minutes when, although he was sweating profusely, two degrees had been gained, and in thirty or forty minutes his temperature was normal. The bed should be only half-full of water, so that the patient will sink into it. The temperature of the water should be from 140° to 170° . The bed should be well covered with blankets so that the patient will not be burned. He is surrounded by this hot temperature, and such a mass of water will keep its temperature for twenty-four hours. When the temperature of the patient has risen sufficiently, you slide him on to the ordinary mattress, and, if necessary, he can be returned to the water-bed. In this way you can control the fall of temperature by hot water as readily as you can control the rise of temperature by cold water, and with less discomfort to the patient.

DR. JAMES TYSON: I believe that it has come to be generally conceded that the continuous use of antipyretics of the class represented by antipyrin in cases of continued fever is on the whole harmful on account of certain depressive influences due to such use of these drugs. I am inclined, however, to agree with Dr. Wood that it is not so much the direct effect of the remedy on the heart as the effect of the profuse perspiration induced by these remedies. I have had some interesting experience with the use of antipyrin in large doses continued for some length of time. I have given fifteen grains, three times a day, as recommended by the French school, for two weeks, with the view of controlling glycosuria, without any apparent serious effect upon the patient. I had to do, of course, with an afebrile affec-

tion, and we know that in such cases perspiration does not follow the use of antipyrin. In the few instances in which it has worked badly it has seemed to produce derangement of the stomach from the size of the dose. I rarely, however, now use these large doses, for the following reasons: In the first place, I was disappointed in its controlling effect; in the second place, where there was a controlling effect—as does occur in the milder cases—the same result can be accomplished by a small dose; and, in the third place, on account of the derangement of the digestion, which sometimes occurs. I have, however, come to the conclusion that the direct depressant effect of antipyrin is exaggerated, in the popular mind at least, if not in the medical mind.

DR. H. A. HARE: I want to speak of one point which I think has been overlooked in the administration of the cold bath in typhoid fever, and which has only recently been brought before the profession in America with the force that it deserves; that is, the importance of applying friction or peripheral irritation while the patient is in the cold bath, in order to cause the heated blood in the centre of the body to come to the surface. As I have seen cold water applied, the patient is usually wrapped in a sheet and sprinkled with a sponge or an ordinary water bucket, or he has been put in a bath-tub and allowed to soak until the temperature falls to what is thought to be the proper degree. This is, perhaps, the common way. Under these circumstances we frequently find that the patient either goes into a condition of collapse or when removed from the bath the fever returns to the same degree as before. The hot blood which has been driven by the contraction of the capillaries to the central organs comes to the surface as soon as the peripheral bloodvessels dilate, the cold being taken away. By the application of friction, however, while the patient is in the cold water the tone of the peripheral capillaries is kept intact, and as I have said the hot blood from the centre of the body comes to the surface and is cooled and is returned. This prevents the internal congestions which have been reported in some cases. This method also possesses the advantage that the friends do not consider it so exposing to the patient that is rubbed while in the cold bath as when he is simply placed there and allowed to soak. With the use of frictions I have found that patients rarely object to the cold. Under the ordinary method the patient when put into the cold water often has what may be called a nervous chill, the cold causing an almost convulsive nervous spasm. If he is rubbed, and the sponging begun not too suddenly this chill is not observed, and the only objection that I have had made has been a complaint of the burning of the skin on account of rubbing too hard.

I have seen a number of cases, such as Dr. Musser speaks of, in which the patient apparently went into a collapse in the course of typhoid fever. This is frequently seen in children and I have also observed it in adults. At my last term of service at St. Agnès' Hospital a year ago, I had fifteen

cases of typhoid fever in which the temperature was subnormal from the beginning of the attack to the end, with the exception of the first few days. It never went above 99° , and was generally 96° or 97° . In another class of cases, more like those mentioned by Dr. Musser, the disease ended by crisis. I now have a man in the Jefferson Hospital whose disease ended typically by crisis.

I agree with Dr. Wood and Dr. Tyson concerning the use of antipyretics in typhoid fever. Three or four years ago when I was studying these antipyretics with Dr. Wood and by myself, I was inclined to give them a great deal, but I found that the treatment of typhoid fever by antipyretics was like placing straw before a drowning man. If the patient is going to have a high temperature for three weeks it is of no use to lower it for half an hour and then have it return. Such treatment is simply giving the emunctories the trouble of eliminating drugs, deranges the digestion and possibly tends to produce cardiac failure. I have, however, never seen cardiac failure, after the use of antipyretics, which was not due to the lowering of the temperature. Dr. Brunton and others have shown that the lowering of temperature is like taking away whiskey from a chronic alcoholic, for heat is a most important stimulant to the heart and respiration.

DR. FREDERICK P. HENRY: The importance of friction during the use of the cold bath is insisted upon by Brand, whose experience of this method of treatment is probably greater than that of all observers here combined. For the purpose of making friction there is nothing better than the vegetable called the loofah. Some years ago I used the antipyretic drugs very extensively at the Episcopal Hospital, but soon abandoned them, and now I do not use them at all. In the experience of Brand there must have been many such cases as Dr. Musser has spoken of, where there was a tendency to sudden collapse and termination of the disease by crisis, such as occurs in pneumonia without any material danger, as a rule. Brand reports twelve hundred cases treated by cold baths, in his own experience and that of two or three others. Of this number twelve died, making a mortality of one per cent. These deaths occurred in cases which did not come under the cold-bath treatment during the first week, and Brand claims that if his rule had been observed, and the cases treated before the fifth day, there might have been no death. The opinion of Dr. Musser that if cold had been applied in his case the results might have been disastrous, is negatived by Dr. Brand's statistics, which must have included cases in which this tendency to sudden fall of temperature existed.

DR. JOHN K. MITCHELL: There is one thing in regard to antipyretic drugs which has not been mentioned. It is an opinion, of course, not capable of direct proof, but my impression is that, where antipyretics are given constantly or as a treatment, the duration of the disease is decidedly lengthened. I believe that others have made the same observation. I recall that Von Jaksch, now of Prague, when I was in the Vienna Hospital with him, stated

his belief to be that the course was lengthened by persistent administration of antipyretics. My experience with the cold-bath treatment has been small, but entirely satisfactory. I have never seen collapse, and all my cases have been rubbed while in the bath. Twice I have seen extraordinary falls of temperature. In one case it fell from 105° to 92° without collapse or symptoms of heart-failure. The temperature was so low that I doubted the correctness of the observation, but it was tested with three thermometers which all registered alike. This patient had sixty-five or sixty-six baths during the five weeks' duration of his disease. On each occasion the temperature fell at least four degrees, and in this one instance thirteen degrees.

DR. J. P. CROZER GRIFFITH: Dr. Mitchell is undoubtedly correct in his opinion that the persistent use of the drugs of the antipyretic class may prolong the course of typhoid fever. Ehrlich, in 1887, called attention to the fact that the spleen remained enlarged an unusually long time in cases in which he had employed what he called "thallinization," and I think it was also he who first noticed that the whole course of the disease was lengthened by the administration of antipyretics continuously.

Dr. Musser's first case is of interest in that it has a very intimate relation to the question of the employment of antipyretic measures in general. I cannot imagine that a pathological process *per se* can ever be of advantage—that fever is a condition to be desired. While it was apparently true that his patient was in a better condition during the portion of the day in which fever existed, yet the state of depression which followed was, in my opinion, directly in proportion to the entire duration of the fever and to the elevation of the temperature. As usual in physiological processes, the over-stimulation was followed by exhaustion. If there had been no afternoon fever, there soon would have been no morning depression. It is for this reason that cold baths should be used as Brand recommends—that is, employed before the temperature reaches any great elevation. Brand advises, I believe, that the bath be given when the temperature reaches the neighborhood of 102° F. I can well see that in a case like Dr. Musser's, or in any case in the later stages of typhoid fever in which the temperature has reached about 105° F., the use of cold water may be followed by collapse.

The employment of the antipyretic drugs is, I think, still more liable to be attended by serious depression of temperature, and not only in typhoid fever, but in all other asthenic febrile conditions, must we exercise caution in administering them. It has been a matter of great interest to me during several years past to attempt to discover just how much good and how much harm could be expected from these drugs. I have been especially interested in the administration of antipyretics in phthisis. Now, it is perfectly possible—though it seems paradoxical—in a large degree to prevent sweating in this disease, and that by the very drugs which are usually so liable to produce sweating in febrile states. This is not accomplished, however, by giving the medicine when the temperature has already reached 104° or 105° F. If

we give it then, we only precipitate and intensify the fall of temperature which is apt, in any case, to occur in the later hours of the night: and we consequently produce greater sweating and exhaustion than if we had let the patient alone. I have tried the administration of small, divided doses of one of the antipyretics, commenced early in the day, a short time before I expected the sensation of chilliness to appear, and in many instances I have kept the temperature from rising to any extent, and, consequently, the sweating from following.

It is not the direct action of the antipyretics which does the harm, but it is the fall of temperature, whether this be the result of natural causes or of medication; and, if we prevent the rise, we shall, of course, have no fall.

I think that antipyretics should not be used simply to reduce temperature, but that some other indications should exist. I have seen patients—as we all have—preserve a high temperature through the course of a disease, and yet be apparently in excellent general condition. In other cases nervous symptoms become marked whenever the temperature is high. We are to be guided largely by the symptoms apart from the height of the temperature. I have through several years preserved careful records of the effect of antipyretics in febrile diseases in children, and have thus procured some interesting data, which I hope to present to the College at a future time. I am sure I have repeatedly removed threatening convulsive symptoms by the prompt administration of antipyretic drugs. Whether this effect was entirely dependent upon the reduction of temperature, or whether it was the result of some special action upon the nervous system, I am unable to say.

DR. MUSSER: I quite agree with Dr. Wood and others in regard to the harm and danger of antipyretics, and in fact in regard to the uselessness of them, during the course of typhoid fever. I never used internal antipyretics in this disease, but I am quite in accord with him as regards the value of cold. While my experience with the method of Brand is too small to enable me to form any conclusion, yet the writing of the Germans and of Dr. Wood, Dr. Wilson, and others in this country is sufficient to convince me of its value. While cold is undoubtedly of value, I am also quite convinced that it is not necessary to use it in all cases. It is not justifiable in private practice unless we have the proper appliances, the proper means to apply it. I always have been opposed to the use of antipyretics in the management of typhoid fever, and the purpose of the few notes that I have made has been to call the attention of the large body of the profession to their dangers, for I am sure that it is quite common among the profession to use these drugs. Those of us who have the opportunity of observing cases in hospital practice are well satisfied that these drugs are dangerous. We have, however, all seen cases in which enormous doses of antipyretics have been administered, and there is no doubt that these drugs are often employed. It was with the intention of calling attention to the few condi-

tions in which the use of these drugs might be dangerous that I wrote this paper, in order to stem the tide toward antipyretics.

If Dr. Wood could tell us how to manage cold as conveniently as hot water it would be of great service to us. In private practice we often have great difficulty in securing proper appliances, and in obtaining the consent of the family to the use of this measure.

DR. WOOD: I have not given this question of the application of cold any consideration, but it occurs to me that possibly we could use the water-bed filled with ice-water, just as we use it filled with hot water.

THE ADDRESS IN MEDICINE.

DELIVERED BEFORE

THE MEDICAL SOCIETY OF THE STATE OF PENNSYLVANIA,

AT ITS FORTY-SECOND ANNUAL SESSION,

HELD IN HARRISBURG, MAY, 1892.

BY

J. H. MUSSER, M.D.,

PHILADELPHIA.



ADDRESS IN MEDICINE.

By J. H. MUSSER, M.D.,

PHILADELPHIA.

THE LIMITATIONS AND THE POWERS OF THERAPEUTICS.

IN accordance with the behests of your by-laws, this paper, which, by the gracious favor of your former president—to whom I owe my acknowledgments, and from whom, I fear, you will ask an apology—I have the honor of presenting to-day, should include a statement of the progress of pathology and therapeutics during the interval that elapses between our meetings. The almost daily publication of annuals, of reviews, and of compendiums renders this work supererogatory. Likewise, too, the general eagerness for, and absorption of, knowledge by the members of our profession increasing each year, as the success of multitudes of journals and books shows, renders each and all of us familiar with the progress from day to day of medical events. While the task would be agreeable, it is unnecessary, and, moreover, it would be well-nigh impossible in the time allotted to present the subject commensurately with its importance.

The spirit of the by-laws need not be violated, however, for it may not be unprofitable to accept its suggestions, and in a few words portray, in a general sense, the status of medicine of the present day. The attempt will be made to show how the management of disease is conducted in the light of our present knowledge of pathology. For as practical physicians, each year, each day, determining in our minds how to manage disease, we constantly appeal to the science of medicine, upon which to base our lines of action. Indeed, all our therapeutic efforts are based upon our conception of pathology. He who has not proper ideas of the processes and causes of disease can

practise medicine only in the same hap-hazard fashion that the conscienceless charlatan dispenses his wares.

First, an outline statement of the science of medicine; second, deductions as to therapeutic measures derived from our scientific conception of pathology will be presented; and finally, a few corollaries, which to the writer are not without value, will be added. Pathology considers the processes and the causes of disease. It is interesting to note that the former are resolved into a small number of morbid actions only—thus, the congestions, the inflammations, the degenerations with new formations, include nearly all the morbid processes that may occur locally. If to these are added mechanical changes that may take place in the canals of the body—as in the heart and vessels, leading to alterations of blood pressure, to dropsies, to hemorrhages, and to thrombi and emboli, when coupled with one or more of the elementary processes indicated above, in the respiratory, the gastro-intestinal and genito-urinary canals, leading to well-known mechanical symptoms—a greater part of morbid anatomy is included. Fever is a morbid process that must not be excluded from the reckoning; this, with the too little understood abnormalities of the blood, and the recondite processes seen in scurvy, rhachitis, and allied disorders, completes the survey almost in its entirety of the possible morbid processes in the body.

If we consider the second division of pathology, the causes of disease from which therapeutic inference can be drawn, we find, too, that they may be divided into a few classes. Following the text of Payne, a classification as follows is all sufficient. Disturbances, therefore, arise from—

1. External causes or injury as seen in
 - a. mechanical injuries or wounds.
 - b. physical injuries—cold, heat, or electricity.
 - c. chemical injuries—irritant poisons, etc.
 - d. specific injuries—from animal poisons, as snake-bite; from living parasitic organisms, as bacteria in all forms.
2. Congenital imperfections of structure, either of organs or tissues.
3. Effects of wear and strain.
4. Senile decay.

Permit me to trespass upon your time for a few moments in a survey of the science of medicine from another point of view. An idea of the pathology of the present day can be gathered from a glance at one of the most recent works on the practice of medicine. I find that in a work of about 1000 pages, five-twentieths is devoted to infectious diseases, including the specific fevers, tuberculosis, syphilis, malaria and the like; one-twentieth to the constitutional diseases, the rheumatisms, diabetes, purpura, rhachitis, etc.; thirteen-twentieths to diseases of the various systems or tissues, the blood, the digestive system, etc.; and one-twentieth to the intoxications and the effects of animal parasites of the grosser kind. On closer scrutiny of the parts devoted to local diseases I find that inflammation of the tissues or organs of each system and the dynamic or mechanical results of such inflammation, as in valvular endocarditis, make up three-fourths of this portion of the entire subject, and that functional diseases of the various systems are discussed in a small portion of the text only. At least the impression derived not only from this work, but from all works on pathology and practice, is that functional disorders are infrequent compared to organic. Not enough stress is laid upon the physiological or functional aspect of disease. I mean the diseases that may ultimately cause or be associated with organic changes, but that have their origin or their beginnings in functional disorders, or which are the result of the violation of physiological laws, the effects of improper environment, or the outcome of inherited tendencies of tissues, and not the effect of injuries or other morbid causes derived from without. In this enlarged appreciation of functional in contradistinction to organic disease, we are impressed with the greater prevalence of the former as compared with the latter, contrary to our estimation derived from books.

Are the statements thus made in accordance with our daily practice? Recall for a moment your *clientèle* of a day. Go over the work you have done the past year. Observe how greatly preponderates the functional over the organic disorders. Please remember, I mean functional in its largest sense, and would include under it gout as well as forms of interstitial nephritis, dyspepsia, and hepatic disorders, or, in another line, the train of symptoms due to muscular insufficiency or eye-

strain. Do not fail to include the developmental diseases and nutritional disturbances of infancy. I include likewise the many inflammations, as of skin or intestinal organs, the outcome of perverted functions, the aches and ills of head and back, the suffering from gastric or hepatic difficulty, from perverted uterine function, the thousand and one ailments due to the fact that too little capital in the shape of good tissue structure, chiefly of nerve, was entrusted to engage in the battle of life, must be included. The many disorders resulting from wear and strain, from combat with environment, including imprudence in food and drink, come under this same category, while the disturbances of senile decay, which may begin at thirty, swell the list. In fact, gentlemen, as practical physicians we are constantly dealing with the disturbances of the body which arise from causes included under the 2d, 3d, and 4th divisions of the etiological classification given above. In fine, three-fourths of our practice, particularly of those engaged in town work, is required in the treatment of functional disorders.

If what I have said is not enough, observe the practice of specialists — the neurologists, the laryngologists, the non-operative gynecologists, the ophthalmologists. Functional disorder makes up their largest work.

At the risk of repetition, therefore, I beg to state our ideas of disease, derived from text-books and from our labors in the pathological laboratories and autopsy theatres, are misleading when we attempt to utilize them in therapeutic management, and too often become of equivocal and minimum value to the practitioner; and this is due to the fact that we are impressed with the results of disease, and not disease as the therapist should see it—cause and process hand-in-hand; while, on the other hand, the practical physician (trained in science, mark you), who sees disease in its beginnings, notes the earliest physiological aberrations, sees functional disorder lead to organic changes, observes aberrant causes lead to abnormal processes, and associates them properly—he more quickly grasps the fundamental elements that make up the condition called *disease*. To such the limitations and powers of therapeutics are clearly outlined. For one group of diseases he becomes a nihilist concerning the use of drugs; for the larger group, the functional, he rapidly embraces methods

which are limitless and all-powerful, promoting life, restoring function, as by proper food, air, exercise, bathing, climate; all hygienic forces become his handmaid, while drugs are accessories of minimum value.

From the above statements of pathology and clinical experience the greater part of our treatment, of all our practice, resolves itself into—(1) the treatment of functional diseases in the broadest sense in which I hoped to portray them; (2) the treatment of the specific, infectious diseases; and (3) the treatment of the general morbid processes (fever, blood disorders, rhachitis, etc.) and local morbid processes (congestions, inflammations, and degenerations), leaving to the surgeon the neoplasms.

In the following pages the treatment of each will be briefly outlined, in order to show in a measure, at least, the limitations and powers of therapeutics as they appear to be established in the light of the modern conceptions of disease. It is only fair to state that in addition we are often driven to the treatment of symptoms; but to recite the special lists of drugs apparently of advantage for the relief of individual symptoms would make this paper more encyclopædic than my time or your patience would permit.

FUNCTIONAL DISEASES.—The management of the functional diseases and the structural affections which grow out of them requires the use of all such measures as restore disturbed, suppressed, or perverted function.

Hence, at once, rest, lessening of wear and strain, change of scene, change of climate, alteration of diet, regulation of exercise, control of every act, of every thought, indeed, of the patient, must be secured. The particular form of functional disorder and the general state of the individual indicate the methods to be pursued. Gastro-intestinal disorders would require particularly dietetic management with exercise, bathing, rest in a proper manner. Renal disorders call, too, for lessening of their function by dietetic management, with the use of other methods which raise the plane of general health to a higher standard. Thus organ after organ, system after system could be gone over and special management applied to each. To-day this sketchy manner must suffice.

A word, however, regarding the administration of drugs.

General functional disturbance, bodily weakness, if you please, or the effects of wear and strain, or premature age, often have their expression in local symptoms, as for instance, failure or perversion of vision, as seen in the multitudinous forms of eye functional disorder, the functional nerve disorders, the dyspepsias and allied conditions in other organs. The question of whether local or general *drug* treatment should be applied is constantly raised. In the dyspepsias, for instance, shall we administer acids and alkalies, bitters and sedatives; shall we wash out the stomach and otherwise treat it locally? Judiciously used this is of value, no doubt; and yet are there not many cases over-dieted as to the particular class of food selected, and over-treated by local methods? Have we not seen many, and would not nearly all, get well by the use of general measures and the active use of a tonic like nuxvomica. By active use I mean, as regards the latter and possibly all drugs,¹ its use in ascending doses. In other lines the same statements apply. The most successful eye specialist whom I know is the one who treats on general lines and with general measures.

Pardon my taking one moment for the statement of a case. The patient was about forty years of age, and out of sorrow and depression emerged a wreck. The stomach was at fault, and for ten months she was dieted and kept in bed. She came to the hospital weighing seventy-two pounds, and left weighing ninety pounds. She came prostrated, she left in full strength. General measures and but little attention to the stomach brought her into good condition. Another, for seven years a neurotic dyspeptic, who thought it remarkable I should not give bismuth and charcoal and acids and a more strict dietary than the one she was on, and who ate and vomited, and repeated this cheerful process day in and day out, in season and out of season. She got up to seventy drops of nuxvomica thrice daily, and left twenty pounds heavier, with good strength and a sunny temper.

I admit the problem is difficult to decide—when to use local remedies aggressively and when cautiously, when to look to

¹ Arsenic in pernicious anæmia and leucocythemia, in ascending doses; iron in chlorosis, etc. etc.

general measures and drugs for relief. One case more of the fortunate kind, and I pass on. The patient, a young girl, had excessive gastrodynia and persistent irregular vomiting. At first local remedies were tentatively used, but a glimmer of chlorosis showed through all. This clue was enough, and Blaud's pills began and ended the cure.

One cannot help but be impressed with the fact that our limitations in the management of functional disorders, barring congenital conditions and other few exceptions, are dependent upon the amount, degree, and force with which we can utilize the general factors, lightly dwelt upon in the preceding remarks. If we are not restricted in their use the power of all elements which increase strength, foster nutrition, allay irritation and promote function, is almost boundless; and, as compared to the use of drugs, is as the giant to the pygmy. As the world grows in wealth the unrestricted use of these powers increases, and fortunate are we, though we witness only the *dawn of a new medicine*.

Just here, it may be remarked, senile decay brings with it a train of functional disorders or of organic change, which, a little reflection will prove to any one, cannot be averted by drugs. Here, too, general methods alone are of service.

As to the treatment of the *specific infectious diseases*, but little need be said. Save malaria and syphilis, for which specifics are at hand, the general management and treatment of them is antiseptic. Apart from this we have not acquired new powers. We have learned that all our therapeutic resources have limitations—that, given a high degree of infection or a feebly resistant constitution, our art availeth little. The more thoroughly we reconcile our ideas, however, to the view of the management of infectious disease by antiseptic methods, the more successfully will they be treated. And I do not mean the use of antisepsis in a narrow sense, limited to the administration of drugs, but in the broad manner in which the surgeons use such methods, with a broad conception of the nature of an infectious disease. We, as physicians, have been too lax in this matter; we have not learned to appreciate asepsis and antisepsis. We need lessons from the surgeon, and should contemplate upon the extraordinary breadth of view which they take of infectious processes and the broad methods of treat-

ment of their patients at the time of and subsequent to an operation. It is extraordinary the results a true aseptic surgeon secures.

I have said we have not grasped his ideas and applied them to our practice. Take, for instance, a case of diphtheria; too large a proportion of such cases die from secondary infection, or get well, to carry some incurable disease, the result of a suppuration in the ear, for example, to the grave. It is largely our fault. The patient with diphtheria should be made an aseptic body at once. Every portion of the body should be cleansed. Every orifice should be washed out, and when practicable they should be closed with cotton-wool, as the ears. The patient should be wrapped or kept in "bichloride" sheets, and all towels and dressing should be of the same character. The room and the articles in the room should be rendered aseptic with most scrupulous care. Time forbids entering into detail regarding the management of these disorders. If difficult to comprehend, observe how Kelly treats his patients, his materials, his rooms at Johns Hopkins Hospital, or how the surgeons treat them at the University, the Jefferson, or any other hospital. We can learn much in the practice of medicine from the surgeon. The same principles apply to typhoid fever, to scarlet fever, to any infectious disease. By them scarlet fever would be robbed of a large percentage, I believe, of its sequelæ and a large portion of its mortality. Deaths from whooping-cough are due to reinfection. They could be prevented largely by antiseptic measures. But I need not go over the list of infectious diseases—the same principles apply to all. I trust I am not held too enthusiastic if I venture to express the opinion that all our so-called "colds" should be in a measure treated in the same manner. The first coryza should be met by antiseptic washes of the nose and throat, and also the ears. The bronchi will be spared from invasion. There are good grounds for belief that "colds" are infectious and contagious. The invasion from membrane to membrane, the constant recrudescence, when once started, points that way. How difficult it is so often to get rid of a cold. How often a so-called "fresh" cold returns. And, moreover, when one member of a family is attacked how often it spreads to all others, even if not exposed to the conditions usually believed

to be productive of colds. Are they not worthy of strict antiseptic treatment? Enough in outline only, I trust, has been said.

Antiseptic medication does not end here, however. Its powers are very great in the treatment of inflammations of all channels that open externally—the mouth, the nares and fauces, the air-passages, the gastro-intestinal and genito-urinary tracts. Again, I am reminded by the flight of time, that I can only state that modern methods have given us new and valued powers in the management of such affections.

In regard to the management of infectious diseases, I hope what I have said may lead us to further thoughts and further action. A word as to chronic infectious diseases, as tuberculosis. In addition to antiseptic measures, the principles adopted in the management of functional diseases must be invoked. Time forbids indulging in what might be profitable discussion in the elaboration of the management of this common disorder.

A conception of the nature of the local processes—congestion, inflammation, degeneration, leads one to infer how far we are limited, how far we have power in their management. Of septic inflammations in channels I have spoken, acute inflammations and congestions demand rest, cold, and venesection, local or general. In these methods we have power; without them we fan the air. Who cannot recite, as occurred a few days ago to the writer, cases like the following: A young man aged twenty, having severe pain in the right iliac fossa, tenderness, tympanitic swelling, fever (103°), nausea, constipation. Or Mrs. A. B. C., severe local pain, tenderness, and vomiting, with high fever. Attended two days by a homœopathic physician for stomach disorder. On the third day, temperature $103\frac{1}{2}^{\circ}$, pulse 128, full; tympany; pain extreme; tenderness. Leeches, mild catharsis, ice externally, dissipated, in forty-eight and seventy-two hours respectively, all the grave symptoms of peritonitis. Not a drop of medicine save a placebo. So with pulmonary, nephritic, and hepatic inflammations. For the degenerative and chronic inflammations we cannot speak hopefully either as to measures or drugs. A prolongation of methods—hence time—is necessary; and rest, mild venesection or counter-irritation may avail in inflammations. Here methods

to unburden overworked organs are called in—methods hinted at when functional diseases were treated, come in vogue.

I can only refer to the fact that scurvy, rhachitis, and the rheumatisms, save acute rheumatic fever (bacterial), but including gout, are treated, and successfully, on lines parallel with the management of functional disorders. By diet in these, much if not everything essential is accomplished, and then hygienic factors are brought to play.¹ The power of drugs is at a minimum. And likewise in the anæmias, if not toxic, except chlorosis, the essentials of management are the same as in functional disorders.

A word further as to the general morbid process—fever. Cold is the only true antipyretic. We must learn to apply in accordance with modern methods and use it more frequently. My impression of its value is such that if I should ever have typhoid fever I want to be treated in accordance with the methods indicated by Wood, and after him the Germans, and so well conducted by Wilson in our own city.

From this cursory review it is apparent to everyone that our limitations in therapeutics are dependent largely upon the character and intensity of the process of disease with which we have to cope; that in functional diseases we have the most to look for; that the management of infectious diseases ought to be improved; that in local processes the limitations are more defined and, if chronic, of less avail; that cold is the true antipyretic. Furthermore, it is even more apparent that the powers of therapeutics are not in drug stores; that the "imponderables" of old—that heat and cold, electricity, baths and bathing, exercise, fresh air, proper diet, proper clothing, and hygienic surroundings, suitable climate, regulated work, and methods to remove causes—are the true powers with which to combat disease. It is true we cannot always command these powers, and vainly I cry out against myself when I must give drugs. Too often it is like the ostrich with his head in the sand.

And now as to practical difficulties. I well appreciate that to carry out antiseptics or to treat functional disorders in the the lines indicated, great time and expense are required. But

¹ Fresh vegetables for scurvy; meats with their lime salts in rhachitis; rejection of sugars and starches in the rheumatisms and gout.

any life is worth being saved. And all should be prevented from chronic disease. In the long run, treatment by the old methods, with chronic invalidism frequently the result, or of some organ as the special senses crippled, involves more expense, more time, more wear and tear. I would I could elaborate this for you, and calculate the actual differences in cost between the two methods. I must appeal to the surgeons again; more patients can now be treated at less expense than formerly. Do not ever, I beg of you, let the question of expense, of trouble, of time, enter into the matter. For the poor let us have hospitals, let us have centres for the distribution of materials and foods, let us have visiting nurses. If necessary, let us rob the name hospital of its terrors, and call them "homes for the sick."

A few thoughts more. If our conceptions of the methods of management of disease are true, and if we develop on this line, looking more and more to broad methods, are we not surely and positively wiping out all schools, so-called, of medicine? As drugs become our minimum aid, do not bickerings fall with them? Can any sect take unto itself, diet, appropriate fresh air, lay hands on physical culture for its own exclusive use? As in theology, so in medicine, dogma is being dissipated. Let us then attend to our business. Let us push precepts and principles like these, and therapeutic sects will be scattered to the four corners of the earth.

Finally gentlemen, again if our conceptions of the management of disease are true, is not our calling elevated thereby? Do we not have added to our responsible duties another, indeed, a higher one? Laboring as we should, do we not become teachers of men, of communities, of the State? We teach the individual physical responsibility to himself for every act; the State learns its responsibility to every individual member of it. Do we not, as did Luke of old, combine the highest callings, and thus constantly labor to ennoble man's estate?

Again, I say, gentlemen, if such be true, well may we congratulate ourselves on the proud, noble position which our profession has attained, and fervid should we be in wishing long life to the Pennsylvania State Medical Society, to encourage and foster the good, the true, and the beautiful in our profession.

With the Compliments of
F. H. MUSSER, M.D.

NOTES ON TUBERCULOUS PLEURISY.

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NOTES ON TUBERCULOUS PLEURISY.

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CASE I.—In the fall of 1890 I was asked to see W. A., the brother of a physician, who was said to be seriously ill. I found a tall, spare man of five and thirty, extremely weak, suffering from chest pain, dyspnœa, and severe paroxysmal cough. Both symptoms caused sleeplessness and great prostration. The cough was most harassing, was spasmodic, and mostly unproductive. A mucous expectoration alone was discharged at times. The dyspnœa was extreme, the respiration, 30 per minute when at rest, would increase to 50 and 60. But little need be said of chest pain. It was so severe as to require constant attention in order that relief might be secured. With the lung symptoms there were fever and sweats. The fever ranged irregularly from 99° F. to 104° F. in twenty-four hours. It was further noted that the appetite was lost, the tongue heavily coated, and the bowels relaxed.

On physical examination the left apex, both anteriorly and posteriorly, was found scarcely to move in inspiration; in the former position immobility reached down to the third rib. The fremitus was absent, the area dull on percussion, the breath sounds absent, except at the spine of the scapula; over the base a distant bronchial breathing could be heard. The right side was contracted, the base anteriorly retracted, and the expansion much lessened. Dulness and absent breath sounds were noted.

The heart was displaced to the left. The physical condition seemed to be due to a greatly-thickened pleura, which capped

the left lung, and to pleural thickening and old adhesions at the right base. The patient had had three attacks of pleurisy; his family were predisposed to tuberculosis, and the patient was exposed to infection. Careful attention to diet, and treatment of the gastric catarrh, respiratory stimulants (strychnine), strapping the chest to relieve pain, with quinine by the rectum, aided the man in recuperation. Subsequently, respiratory gymnastics, tonics, and an out-door life brought him in condition to return to business. When last seen by me the parenchyma of the lung had apparently not been invaded. [Patient in active business at present—1894.]

The above scantily recorded case represents an extreme type of pleurisy which is of tubercular origin. The family history, the occurrence of repeated attacks of pleurisy, the occurrence of cough, pain, and dyspnoea as previously indicated, with some emaciation, point very strongly to tuberculous pleural infection. The fever and sweats are characteristic phenomena of the tuberculous process.

It would scarcely be credible that large thickenings of the pleura could develop were we not familiar with the findings of post-mortem examinations. Frequently great masses are seen. The writer recalls one case in which masses four and five inches thick surrounded the compressed and collapsed lung, which was free from disease. Some fluid filled up the greatly shrunken pleural cavity. Practically, the man lived with one lung. Correct conclusions as to the physical condition of the lungs arose particularly from the prominence of the facts derived by inspection and palpation—retraction, lessened movement, and lessened fremitus with absent breath sounds, and decisive symptoms which would occur in cases in which fluid or inflammatory exudations are interposed between the thoracic wall and lungs.

CASE II.—The patient was a farmer's wife in Lancaster County, aged forty-five, who had borne two children, and had attended to the exacting duties incident to her husband's occupation. She was exposed to infection at about twenty-five. After this period she was in impaired health, and under weight without cause, or at least without known cause, for the reason

that trouble had not been taken to ascertain the cause. Finally, after a season of care she took to bed. She lost more flesh, had fever, and some sweats, cough racked her, and there was dyspnoea on exertion. The illness continued over several months. If the weather was inclement she would keep to her bed; generally she would rise for two or three hours each day. When seen by the writer she had cough which kept her awake, dyspnoea, and chest pain. The physieal signs of thickened pleura were found at apex anteriorly, and over the scapular region of the right lung. The patient was emaciated to a moderate degree, listless, and worn from cough. She gradually improved, and as spring advanced went out, and is now fairly well, although not able to take on excessive and unusual labors.

CASE III.—A woman, seamstress, aged twenty-five, was ill two months with unilateral pleural effusion, which was aspirated. She did not improve, had a mild fever, was growing weaker; an effusion on the opposite side was found. After a long illness (two months) she fully recovered, and now, six years hence, is conducting her occupation.

CASE IV.—An Irish laborer, aged forty, prematurely aged in appearance, was admitted to my ward in the Philadelphia Hospital with bilateral pleural effusion, detected by the usual physical signs and by aspiration. There was no dislocation of the heart. Cough, dyspnoea, and chest pains were the most pronounced symptoms. There was much mucous expectoration, which never contained bacilli. The dyspnoea occurred in paroxysms as well as being constant. When admitted the temperature was about 102° in the evenings and 100° in the mornings. After a week in bed it fell to normal. The patient was much emaciated. The fluid aspirated was bloody and contained bacilli, and when guinea-pigs were inoculated tuberculosis was set up.

The patient remained under observation all winter. The effusion gradually lessened, and the weight and strength improved. The cough and expectoration subsided, but dyspnoea on exertion lingered a long while. The physical signs of thickened pleura remained at the bases, but no contraction of

the chest or dislocation of the heart was observed on the last examination.

CASE V.—The patient was sixty years old and has had a hard life. He had one testicle removed by Prof. Ashhurst in 1885, and the second at the Episcopal Hospital in 1887, because of tuberculous disease. He improved, but did not recover full health. He had been under observation the past three years in the Philadelphia Hospital. Cough and dyspnoea harassed him. The latter symptom was most marked. He was under weight and feeble, but did not have fever. The anterior portion of the left thorax was contracted, behind it was unduly prominent. A thickened pleura with absent breath sounds and without fluid extended from the third rib to the margin in front, and from the middle of the scapula to base behind. Absent movement and fremitus with flattening and progressive retraction were noted. There was no history of acute pleurisy; the progress was gradual: after being under observation two years infection of the right lung took place. Latterly the tuberculosis became general, and death was caused by infection of the cerebral meninges.

CASE VI.—The patient, an Irishman, aged thirty, who has had attacks of pleurisy, is in the wards of the Philadelphia Hospital. He is under weight, and, although able to assist in light hospital duties, has some cough and much dyspnoea. The left lower three-fourths of chest is retracted in front, bulging behind. It is non-expansive and fremitus is absent. Dullness is marked. Apex of heart is not detected. The apex of the right lung is the seat of commencing tuberculosis. In the second and third interspace of left lung there is low-pitched bronchial breathing. At the extreme apex of the same there is harsh breathing. The sputum contains bacilli but no elastic fibres. With the exception of the apex behind, the whole left lung is useless, and apparently being gradually closed in the grasp of contracting tuberculous exudation.

The above series of cases represent various types of cases familiar to all of you. Other examples could be given of different location, mode of progress, and type.

MODE OF ONSET. It is thus seen that the disease may develop in several ways.

1. It may develop acutely or by a series of acute attacks, eventuating in chronic chest deformity, poor health, and persistent dyspnœa with occasional cough.

2. Acute pleurisy with effusion may occur; often the accumulation may be bilateral. The same prolonged impairment of health, emaciation, and dyspnœa will be found. Chest deformity will not be so marked, but the respiratory capacity is lessened.

3. It may develop insidiously, as in the case that arose secondarily to genital tuberculosis.

DIAGNOSIS. We note in most instances that the patients are adults, over thirty; that they are under weight; that they are unable fully to meet the requirements of an active life; that they have periods of poor health, during which exacerbations of fever, cough and dyspnœa occur; that dry painful cough and dyspnœa are the most marked pulmonary symptoms.

General and pulmonic symptoms point to the condition. Emaciation is the most marked of the former. It is not extreme. It is seen in the gaunt subjects in the middle period of life who have chronic cough, and are often laid up with pleuritic attacks. The patients are from ten to twenty pounds under weight. They are somewhat anæmic. If compelled to remain in-doors it is more marked. The lips are blue. The patients are sensitive to cold and dampness. The latter excites pleuritic pains. Gastro-intestinal catarrh is common. The patients are then sallow and have bilious attacks.

Of pulmonary symptoms, unproductive *cough* is the most harassing. The cough is readily excited by faucial or other irritations. It is dry and spasmodic; repeated efforts may result in the expectoration of a small amount of clear mucus. The expectoration does not contain bacilli. *Dyspnœa* is present to a greater or less degree. It is excited upon unusual exertion. It is not asthmatic in character, and does not interfere with sleep. The latter is always secured if cough or chest pain is not troublesome.

PAIN. The pain may be more or less constant. It is then oppressive in character, and like a constriction or indrawing. It is associated with much chest deformity, dislocation of organs, and dyspnoea. Acute pain follows "cold," exposure, or over-exertion. It is the familiar oft-recurring "stitch" that patients are affected with from time to time. While the general and local symptoms point to the true nature of the case, the *physical signs* are of the utmost value. They are elicited by the usual methods, but stress must be laid upon the importance of inspection and palpation. Without resorting to these methods, unfortunately too infrequently done, the diagnosis cannot be established fully. Indeed, the disease is overlooked, I am fully convinced, because inspection and palpation are not resorted to.

EXAMINATION OF SEROUS EXUDATIONS. The result of such examination is rarely satisfactory. In one case only were bacilli found in the serous exudate out of many in which they were sought for.

INFECTION. I am fully convinced, however, that in cases of the above symptom-group we are justified in laying much stress upon a history of exposure to infection. If, with such symptoms, exposure is demonstrated, the diagnosis is pretty well established. Primary infection of other organs in a patient with such symptoms renders a diagnosis almost final.

Tuberculous pleurisy is distinguished from pulmonary tuberculosis by the large extent of signs of pleuro-pulmonic invasion, in comparison with the general symptoms, by the age, by the absence of extreme hectic and extreme emaciation, by the difference in the character of the sputum, by the absence of bacilli, by the unproductive cough, the extreme chest pain, and the chest deformity. The middle or basic portions of the lung are most frequently affected.

COURSE AND TERMINATION. 1. After an illness of three months or more, with or without effusion, a cure may be fully established. We must not be deluded into believing that reinfection either of the pleura or the lungs will not take place because full health, weight, and strength are restored. The cases of acute pleurisy which afterwards become tuberculous

are of this class, of which many examples might be given. 2. Other cases do not get well, but remain stationary with five conditions—impaired strength, reduced weight, shortness of breath on exertion, more or less cough, and gradual chest deformity. 3. General infection may take place. 4. The lungs may be invaded, and the pulmonary type overtop the pleuritic. Infection remote from the primary pleuritic attack may take place. One patient, aged fifty-four, had a long winter's bout with pleurisy with effusion. Three years afterward tuberculous caries of the vertebræ developed. Another, exposed by nursing her son, had apical pleurisy. The third rib became carious, and, although it was excised by Agnew, the vertebræ became carious, and now bone tuberculosis is at its height. 5. The peritoneum may be infected, particularly the sub-diaphragmatic peritoneum, with hepatic and splenic tuberculosis. It must not be forgotten that in many chronic cases of primary tuberculosis the major lesion is in the pleura, thereby preventing the rapid decline otherwise expected from the apparent excess of lesion as the physical signs would appear to indicate. Moreover, out of this type comes a large portion of the group of cases of fibroid phthisis.

PROGNOSIS. It is always cheering to make out a tuberculous pleurisy when in the midst of much pulmonary tuberculosis. First, the probability of a cure is very much greater than in other forms of tuberculosis. Second, a partial cure can be promised in many cases. Then the progress is slow, and hence the duration of life much greater than in pulmonary tuberculosis. The symptoms of the terminal stage are, however, more distressing. The dyspnœa, the breast pang and chest constriction, the internal suggestions of dragging or pulling, as upon organs, are agonizing to witness. The harassing cough is most weakening to the patient. Tuberculous peritonitis, of sluggish type, adds to the severity of the terminal symptoms.

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